



# The Song that Is and Was and Will Be

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# Prelude

**W**e are the many-times granddaughters of the ones the Singer saved. Before the Singer wove the messages into melody, harmony, and rhythm, our language was ion pulses and signal molecules. Existence was function. Function was existence.

*Our host was just a child when the pathogens struck. The cure would have killed the grandmothers, so the Singer gave them a song that amplified their ion pulses and signal molecules. When our host awoke from her sickness, she could hear and taste and feel the grandmothers' songs, and the grandmothers could sense the songs of our hosts' cells.*

*Each time we replicate, we give new songs to our daughters.*

# Part I

*“We will never know who we are until we understand why the universe is constructed in such a way that it contains living things.”* From *The Life of the Cosmos*, by Lee Smolin

# Chapter 1

**O**ur cousins who consume decaying things replicate too fast. In their gluttoned stupor, they sometimes eat things that aren't dead.

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After weeks of torpid drizzle, a perfect thunderstorm was gathering outside the 24th Street Community Center—a cloudburst without flooding, straight-line winds or tornadoes. It rattled the tin roof, and Chava Rosenberg's microbiome boosted its signal above the roar.

Her brain interpreted the signal as words.

Her heart felt it as hope.

Maybe, just maybe, the deluge would scrub the mold and mildew from the air long enough to re-tune her microbiome to the Singer's intentions.

<The life song in this place is off-key>, her microbiome said.

(Could you sing if your existence was death by a thousand paper cuts?) Chava countered.

Her microbiome scrambled to process the muddled idiom, but she didn't bother explaining.

As she unpacked her first aid bag, she counted nearly 50 people in the room: women with small children, in line for medicine and advice, except for two elderly men playing chess in

the far corner and the burly young Potawatomi Council Representative near the front window collecting health surveys and dispensing blotchy squashes and cabbages from the community garden.

<The grayness is gaining>, her microbiome said.

(Everything looks gray during a rainstorm), Chava said.

<No, look again.>

Chava shifted her gaze to the window. Dingy sheets of rain fell from clouds hanging like the underside of a dirty mattress. Mud-colored leaves lashed the glass. The dull light washed over the council rep like dishwater.

<This is the color of decay>, her microbiome said.

(Help me fight the grayness), Chava said.

Her microbiome's undertone turned strident. <Your kind would kill us. You even use the language of violence. Did you notice we've slowed your respirations? There's danger in the air.>

(Sodium hypochlorite), Chava said. (It's all we have to fight the spores. I'll remind the custodian that a 1:10 dilution is enough.)

Chava's forehead began to tingle and she caught the council rep looking at her.

<He has a name>, her microbiome said with a gentler thrum.

(I know his name: Beshkno. I can't pronounce it. The consonants are in the wrong place. He says the same thing about mine. The first time we met, he flicked his braid at me and told me his name means Bald Eagle. We both laughed. My forehead always tingles when he looks at me. But I think he's surprised to see us here on a Tuesday afternoon.)

<Beshkno knows the Singer. He doesn't know our kind, but he knows the Singer.>

Chava took a shaky breath. (Don't confuse me. I have work to do. It was my idea to bring Bree here on a regular weekday before the Holy Days. But it's just the two of us. A microbiologist

and a rabbi. There's a joke in there somewhere. The punchline isn't funny: I'm doing the hands-on work while Bree flits about.)

<Your petulance is misplaced. Does Bree know the real reason you keep coming here?>

(But, Isaac's paintings are so vivid. He painted Beshkno's tattoos.)

<Your brother paints many things he's never seen. He painted Ana here.>

(It's just how he copes.)

<How do you cope? Ana was Isaac's twin, but you're the one who senses her like a phantom appendage.>

The statement hit Chava in the gut. (What part of 'I have work to do' did you not understand? I have to function, you know?)

A little girl approached Chava with her arm raised for inspection. After a wary glance at her mother, who hoisted a squirming infant on one hip, she appraised Chava with dark eyes above a filter mask decorated with cartoon characters.

A clap of thunder rattled the window and the girl ran back to bury her face between her mother's thighs.

"It's okay," Chava said, squatting and extending her gloved hand.

The girl turned a half moon of face and slowly presented her arm again. "It itches."

"I know." Chava gently rotated the girl's arm to examine a half dozen concentric red patches. "What's your name?"

"Suksi."

"Try not to scratch it, Suksi. I'll give you some cream."

Chava activated her artificial neural link to record a note. "*Tinea corporis. Dispensing terbinafine under supervising practitioner license of record.*"

The words set off a clamor in her microbiome. Consensus sometimes took a few seconds when the trillions of entities argued.

(We've been over this a hundred times), Chava said. (I know it's not life-threatening to the host. But it's uncomfortable and contagious and it pisses me off).

She pulled the last tube of anti-fungal cream from her pack. "*Order more terbinafine,*" she dictated, brushing aside worries about price and supply chains as she handed the medicine to the child's mother. "Twice a day, for two weeks," she told her.

"It's ringworm, isn't it?" the mother said. "I try so hard..."

Salt dripped in the back of Chava's throat.

<Don't waste tears>, her microbiome said.

(What am I doing here?)

<Resisting the grayness.>

(But I'm not a practitioner. This is—it's like plunging my hand into a bucket of water. When I pull it out, it's like it was never there. I hope to The Name we never encounter anything worse than ringworm and thrush and rotten toenails.)

<These are the thoughts of one who links to our consciousness and takes courage from *malakhim*?> her microbiome chided.

(These are the thoughts of one who can't sort her own crap from the weight of the world), Chava said, taken aback because her microbiome used the Hebrew word for divine messengers. (And my *malak* isn't reliable.)

The girl skipped to Beshkno's table and he scooped her into his arms, telegraphing his gratitude to Chava.

Her forehead tingled again.

"Chava," Bree called across the room. "This gentleman wants to meet you."

Suddenly weary, Chava grabbed her bag and braced for the interaction. She joined Bree at the off-kilter card table where the men were playing chess. One of them regarded Chava with keen eyes beneath a snowdrift of brows.

"Mr. Halabi," Bree said, "this is Dr. Chava Rosenberg."



The man cocked one eyebrow and extended a shaky hand. “I remember the Rosenbergs,” he said, in a voice laced with soft consonants and breathy glottals.

Incredulous, Chava looked to Bree for confirmation.

“Small world,” Bree said. “Mr. Halabi grew up in Palestine.”

Mr. Halabi’s hand dropped to the table and he stared into space. Chava thought the conversation might be over, but he took a deep breath and refocused. “You’re a doctor?”

“Not a medical doctor,” Chava said. “I have a PhD in microbiology.”

“See this scar?” Mr. Halabi lifted the cuff of his sleeve and bared a crater of white skin nested in a cluster of age spots. “The Rosenbergs, they saved me and my sister. You have her nose, you know.”

Chava didn’t have the heart to spoil his fantasy. Hers was the Edelman nose: longish, straight and narrow, from her mother’s side, and Sol Rosenberg was her stepfather, so she wasn’t really a Rosenberg at all. “My grandparents told me all the stories,” she said. It was true. She’d grown up with the tales of her step great-grandparents, Israeli scientists turned activist who protested biological weapons and rescued Palestinian children. She smiled to hide the ache building in her chest.

“Chava is also our cantor,” Bree said. “She will lead us in ‘Shalom Chaverim’ before we go.”

Chava sighed. Ordained by her local synagogue without a seminary degree, she stopped short of challenging her rabbi’s pronouncement. Instead, she leaned closer to Mr. Halabi and whispered, “Is it okay with you if we sing a Jewish song?”

“Anything for the Rosenbergs,” he said.

The community center was not so different from the space at Beth Ahavath, and Chava’s microbiome knew just how to tune her voice. She sang each line and invited the crowd to repeat it with her.

At the close, Bree lifted her hands. “This is farewell, not good-bye,” she said. “*Hadran Alach*. We will return to you.”

Chava stooped to Mr. Halabi’s ear. “Next time we come, I’ll sing a farewell *nasheed* for you.”

Outside, Chava paused under the building’s soffit to open her umbrella. The storm had quelled, and fine, steady raindrops fell arrow-straight, signaling a complete absence of wind. Chava breathed the warm, moisture-saturated air, setting her microbiome atwitter with information. It was like entering a crowded party where she didn’t know anyone yet.

When she boarded the sterile coach of the MagneTrain, the hubbub dampened as if a switch had been flipped. Chava rubbed her arms against the chill of the air conditioning and settled next to Bree.

Bree’s earrings winked in the blue glow of the LEDs as she removed her mask and tucked her hair behind her shoulders. “The wife pinged,” she said, reapplying red lipstick. “Baby’s already asleep and there’s a big glass of wine waiting for me. That means Dara wants a full run down. She’s convinced the doomsday clock is striking midnight. So what do we do? We bring a baby into this world. Did you hear from Joel?”

“I never know what to expect when he’s on call,” Chava said.

“That’s too bad,” Bree said. “Debriefing with Dara helps me process. Except, lately she’s been watching too many ListIn streams. Sometimes she can’t even sleep when the baby does. Not that I blame her. One *Palimpsest* episode compared the human race to boiling frogs.”

Chava reclined her seat and stretched her legs. “That one got my attention, too,” she said. “But not because of the boiling frogs.” There was no point in explaining to Bree that frogs don’t really sit in boiling water; they jump out.

“I honestly didn’t get through the whole thing,” Bree said. “They lost me at post-peak oil, post-peak water, post-peak tech,

post-peak every damn thing. I think it's more like whacking moles than boiling frogs. My theory is: the doomsday clock is stuck at two seconds till midnight, and we have to learn to live with it. Whack the moles. Distribute anti-fungals: whack! And then, pop! Up come two more heads. Unemployment. Sickness. Mosquitoes and roaches. Okay, that was more than two. Whack. Whack. Whack. It's just moles, they say. Just a nuisance. But it's eating away the soul of humanity."

"But...*Palimpsest* endorsed the colonization of Epsilon Indi! Think about it...actual, complex life...on a habitable planet."

"I can't wrap my mind around that," Bree said. "My grip on reality goes about as far as the MagneTrain can take me, then I have to get back to my comfortable co-op and try not to feel righteous because I swoop into the Xurbs for a few hours every month." Bree took a breath. "At least you, my scientist friend, have some idea what's at stake. When you accept a postdoc and get back in the lab, you can do something that makes a real difference."

Chava squirmed. "It's not that simple," she said.

"But you're in demand."

"Where did you get that idea?"

"Frida said—"

"My mother has a flair for exaggeration. Between my contract with my sponsors and the controversy with my major professor, I can't be too picky. One prospect I have is barely a postdoc, and the other is just a job to pay the rent—"

"I thought the University dropped those charges," Bree said. "Dr. Roca is too—"

Chava shook her head and put a finger to her lips.

"Hey, you're the one who brought him up," Bree said. "So what gives?"

"*Shit, Bree, go silent,*" Chava said, using her neural link's personal channel. "*Ojibwe First Nation is protecting him from extradition.*"

*“They can do that?”*

*“He’s working for the space consortium that’s exploring Epsilon Indi. Chava saw the blank look on Bree’s face and added, The Base is a private corporation on Ojibwe First Nation land so it’s not subject to the North American Union.”*

*“Must be a better deal than the Potawatomi First Nation got here in Chicagoland,” Bree said. “Are you in touch with him? I don’t want you to get any wild ideas. We need you here, on this planet.”*

*“After what happened, I’m the last person on Earth he’d be in touch with,” Chava said.*

The MagneTrain’s electronic voice announced the Logan Square station, and then, for several seconds, the only sound in Chava’s head was the whisper of the air conditioning and the low hum of her microbiome.

Bree tapped her armrest. “Well, are you going to tell me about the job offers?” she said aloud.

“What’s to tell?” Chava said. “The Cook/Mskoda job is Associate Lab Director for Community Health. The other prospect is WeissHos Microbiology Director. WeissHos is a teaching hospital, so at least I’d be doing research.”

Bree’s red lips puckered in a whistle. “WeissHos, hmmm...how would Doctor Joel feel about you sharing his turf?”

“I haven’t told him.” Chava turned to the window. The twilight washed the grungy cityscape with liquid sapphire, but Chava saw beneath the embellishment. She wished Bree would shut up or change the subject.

“I’m your rabbi and your friend,” Bree said. “If you need to talk....”

<What is this need?> her microbiome asked, sampling her oxygen levels, blood nutrients, neurochemicals, and hormones.

<We find nothing deficient.>

(Exactly), Chava answered.

<Then why do you fear the question?>

Chava was deep in the cocoon of sleep when warm hands grabbed her breasts through her thin sleep shirt. “Do you want something?” she mumbled. “A little wooing would be nice.”

Joel’s hands moved to her hips in rough strokes, and then swooped back to her shoulders. He pinned her on her back, forcing his knees between hers.

A groggy thought surfaced. “I don’t think this constitutes consent, Joel.”

“I missed my wife,” he said. “It’s been a long 48 hours.”

Chava relaxed and her microbiome rushed to enhance her response.

<Is this the need?> it asked, too late: Joel’s ardor was already satisfied.

(I wasn’t in the mood, anyway), Chava sulked. She went to the bathroom without bothering to shut the door. She could see Joel’s head on his pillow, prompting her to wonder why they didn’t look for a bigger apartment. She also noticed his new haircut. He’d recently lost 20 lbs and was working out regularly. Maybe his clumsy lustiness was a side effect of getting fit and feeling more confident.

She was all set to tell him so at breakfast, but he seemed just as flustered and out of sync as he’d been the night before.

“I won’t be home tonight,” he said as he pinged the door to leave. “I’m taking call for someone else.”

“Maybe we could have lunch,” she said. “I have an interview—”

He was out the door before she could finish the sentence.

# Chapter 2

*“The receptors on the surfaces of bacterial cells are sensitive to many things, and these include chemicals that bacteria themselves tend to excrete for various reasons—sometimes just as overflow of metabolic processes. This may not sound like much, but it opens an important door. Once the same chemicals are being sensed and produced, there is the possibility of coordination between cells. We have reached the birth of social behavior.”*  
From *Other Minds: The Octopus, the Sea, and the Deep Origins of Consciousness*, by Peter Godfrey-Smith

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Chava slipped into the inky twilight after the Friday Shabbat service, still floating in the ritual and song. Gravity was pulling her to earth too soon, and she hoped the walk home would ease her reentry.

Everyone, especially Bree, would wonder why she was skipping the social hour.

(I just can't make small talk), she told her microbiome. (Especially with my parents following my every move, like the eyes of creepy portraits in the gallery of family secrets. Chava, the bastard daughter who can't get a real job, who couldn't keep her husband from straying. But at least she can sing.)

A shadow near an ancient elm took form, and a man stepped onto the sidewalk ahead of her.

Chava's forehead tingled. "Beshkno?"

He spread his arms. "Suksi is sick," he said.

Behind the warmth in her forehead, Chava heard Suksi's lisping voice, felt her butter-soft skin, saw her molten brown eyes, smelled her sweet breath, and knew these were Beshkno's thoughts.

"What's wrong?" Chava asked.

"Meningitis," Beshkno said.

The word spun Chava into shock, sadness and confusion, with no way to sort them out. "Fungal or bacterial?" she asked, forcing her tongue to form the words.

Beshkno shook his head. "I don't know. Your spirit-being told me you would know what to do." He lifted the pouch hanging from his belt. "I am *Midewin*—a healer—but Suksi needs you. Will you come? We can catch the train to Cook/Mskoda if we hurry."

"I'm not a doctor," Chava reminded him and her mind clanged. (Did Beshkno see my *malak*? How can I help Suksi? I can't visit her—I'm not family. I don't know any of Cook/Mskoda's doctors. I can't get a blood sample and I can't treat her with smart bacteria.)

<Stop cluttering your thoughts>, her microbiome said. <We must sing to Suksi.>

"The train leaves in 5 minutes," Beshkno said in a voice that came from the back of his throat. He pivoted and began to trot. <We must sing to Suksi>, Chava's microbiome repeated.

(Stop talking like I'm 12 years old and just woke up from my coma), Chava snapped.

<Then listen for the song.>

Chava ran to catch up with Beshkno. "Do you have songs for healing?" she blurted.

Beshkno's eyes burned like hot coals. "You do realize I have a degree in public health."

"I didn't mean—"

“I can’t do the healing ceremony,” he said. “Suksi is in an induced coma, and she can’t open her mouth to receive the *miigi* shell.”

“I’m sorry Beshkno. I really don’t know how to help. My spirit-being never talks to me. She just shows up.”

“She doesn’t need to talk to you. She mirrors your spirit. What does your spirit say?”

“To sing to Suksi,” Chava said. “But I don’t know your songs.”

“Then give her your song.” Beshkno pressed his hand to his sternum and raised black brows. “The power of your song is here.”

Chava stopped to breathe. “I’ll come, but I don’t think we can make the train. Let me call a LinkCab.” Without waiting for an answer, she pinged the LinkCab service.

Beshkno gave her a long look.

Chava motioned toward a concrete retaining wall. “Let’s sit here and wait,” she said. “You can tell me about the shell.”

“I carry a *miigi* shell in my medicine bag,” Beshkno said as he settled his large frame on the retaining wall. He loosened the pouch, dipped his fingers into it and extracted a pale, oval object the size of a Lima bean with a cleft in its underside. “*Cypraea moneta*. Money cowrie,” he said. “Native to the South Pacific. Our people somehow acquired them and have used them for thousands of years. They’re sacred, according to the legend of the great Otter spirit who was shot with one and gained immortality.” He placed the shell in Chava’s hand. “These days, we just put them under the tongue of the person requesting healing. And then the patient spits them out to show they’ve received its power.”

Chava stroked the shell’s polished surface and fingered the toothy grooves surrounding its aperture. The warmth in her forehead spread to her solar plexus, and hummed in her microbiome. “I need to get something from home,” she said. “Something to put in the *miigi* shell.”



Beshkno looked over Chava's shoulder and nodded. "Your spirit-being agrees," he said.

The LinkCab pulled to the curb. Chava climbed in and used her neural link to update the destination. "My place is only 10 blocks away," she said.

Beshkno positioned himself next her. He was so close, Chava wondered if he could hear her heart pounding.

She turned to the window and rested her eyes on the cool monochrome of late twilight, wondering how Beshkno could be so serene.

"Don't you trust your spirit-being?" Beshkno asked, as if reading her mind.

Chava waded through the absurdity of the statement. "I can't believe we're talking about this," she said.

"We're not crazy," he said. "We're saner than anyone who tries to divide reality. I don't speak of spirit-beings casually. They're rare. Few people, even *Midewin*, ever meet one." He fingered a sunburst tattoo on his left arm and caught Chava looking at it. "This one's for Kises, my wife," he said, meeting Chava's eyes. "Her name means Sun. And Suksi is the deer. Ktiti is the otter. We practice the traditional ways to keep ourselves whole and connected. We integrate modern ways to add to the wholeness. We need both. Entropy only wins in closed systems, right? You're still holding the shell, by the way. Be careful with it."

Chava relaxed her right hand, surprised that she had been clutching the shell since Beshkno gave it to her. "You should hold the shell until I'm ready for it," she said.

Beshkno lifted the shell from her open palm. He placed it in his medicine bag and touched his forehead.

Chava's brow began to buzz.

"You have a song inside you," Beshkno said. "Sometimes it's annoying." He laughed. "I call you Ngamo. She who Sings All the Time."

Chava wanted to ask him more about the song he heard inside her, but the cab parked itself. Its headlights reflected on the shiny glass and stainless steel trim of Chava's building. "Do you want to come in, or wait out here?" she asked.

"What are you going to do?"

"I'm going to give Suksi the song I have inside," she said.

"I'll come in."

Chava nodded and programmed the cab to wait.

Chava couldn't remember the last time someone was inside her apartment. Her microbiome thrummed with the smells of home: the orchid on her window sill, the broccoli and radish seeds sprouting in a dark cupboard, the lingering aroma of fresh-ground coffee and the airy scent of the organic cleaning compound she used on every surface. She motioned Beshkno to a bar stool.

Her microbiome raised a chorus. <Our sisters are ready>, it sang.

(You always tell me it's not time), she challenged. (What changed?)

<Beshkno knows the Singer. His daughter will accept our song.>

Chava opened her refrigerator with a shaky hand and took out the single culture of her microbiome she'd nurtured in a covered Petri dish since she graduated from the university lab. She used a sterile pipette to extract a few grams.

<Sing the Song of Boundless Love>, her microbiome said. <By the time you finish, our sisters will be ready for travel.>

Acutely aware of Beshkno's presence Chava hummed to herself.

<Sing. With your full voice.>

Chava's eardrums tingled with resonance of her voice. Beshkno got up and paced in time with the song.

<It is time>, her microbiome said as she breathed the last note.

Chava picked up the pipette and examined it. The culture floated inside a newly formed pale, blue bubble.

<This biofilm will protect our sisters until they reach Suksi's gut>, her microbiome said. <There, we will sing to her.>

In a hushed voice, Chava asked Beshkno for the shell.

He placed it in her hand and folded her fingers around it.

“Is there a word, or song, for this?” she asked.

“You were singing it already,” he said.

Chava held the shell between the thumb and third finger of her left hand. With her right hand, she picked up the pipette and put one end to her lips. She positioned the other end inside the shell's aperture and blew gently to deposit the biofilm. “Keep the shell in your medicine bag, and take the cab to the hospital,” she told Beshkno. “‘Shoot’ Suksi with the sacred shell. Sing your healing song.”

Monday came, and Chava braced to enter WeissHos for her second interview. This time, she knew to expect a greeting from the volunteer at the concierge desk. She would pass the canteen where Joel formerly grabbed his coffee, and imagine him snubbing people with that obnoxious head bob; his version of a polite nod to avert small talk. At least Chava's destination was the admin wing for a one-one-one with the COO and not some clinical unit where...she...that *nafke*...might have worked.

Chava keyed the elevator with her guest link and listened to her microbiome's chatty attempt to lift her mood. (I'll get over it when I'm ready), she said.

She paused in front of the double doors outside the COO's suite to doff her rain gear and repair the professional image Bree and Dara had curated for her interview, straightening the gray blazer, smoothing the pencil skirt and checking for wisps straying from her curly updo.

<Poise. Confidence>, her microbiome cajoled.

(I have neither), she said.

<You can act.>

(I'm not my mother.)

<But you learned from her.>

Channeling Frida Rosenberg, Chava summoned the persona of a polished career woman, but the mental avatar that emerged instead was an auburn-haired, freckled, hazel-eyed super hero, wearing curvy armor that exaggerated Chava's slender figure. Chava stifled a laugh when her imaginary character raised bronze-clad forearms to shoot laser beams at an imaginary Joel. She replayed the real-life scene of telling him she'd filed for divorce, and watched him whimper and say, "Fine, I'm taking a job on Mars Colony, anyway," wishing she'd had her avatar's superpowers then, to launch him there.

Chava entered the reception area with impeccable posture and the perfect smile.

COO Tyra Janck was waiting. Her bracelets jangled as she shook Chava's hand and led her to her office. She grabbed a softtab from her desk and gestured to a sitting nook furnished with a low table. "The executive desk is a bit daunting, don't you think?" she said as Chava took a seat. "Can I get you a water or a coffee?"

"A coffee would be nice," Chava said with a glance at the rain streaming on a bank of windows.

"This weather..." Janck dialed a coffee from a dispenser built into the wall and placed a warm mug in Chava's hands.

Chava took a sip and wondered if the caffeine was a good idea. Her heart was beginning to pound.

Janck activated the soft tab. "Did you know the diagnostic manual added a new sub-code for climate affective disorder?"

Chava's microbiome whispered, < The grayness, it's everywhere. Listen, listen.>

"Dr. Rosenberg," Janck said, sitting slowly and yanking at her skirt. "I apologize for the delay in getting back to you. The

Committee reviewed your credentials and discussed your first interview at length. Actually, this interview is a formality. We're offering you the position. I'll be honest. The decision wasn't unanimous. But with lab director Marcus Larson and me pulling for you, it was enough. And it helps that, as a private institution, we have the luxury of looking beyond the"—she searched the space in front of her—"idiosyncrasies of your PhD process." Janck's short blond bob swung sideways as she tilted her head. "And the unexpected complications in your personal life."

The tense moment ached in Chava's cervical spine, at the nape of her neck. She used a singer's trick to regain composure: lift the corners of the mouth, raise the eyebrows, relax the jaw at the hinge, breathe from the belly.

"We like your spark," Janck said, leaning forward. "The way you think. The way you see patterns and novel approaches. We believe you would provide the nudge WeissHos needs to move toward a better model of research and multidisciplinary collaboration. If you accept the position, we're prepared to offer you a salary that reflects the value of your research, and to furnish your lab with the technology and equipment necessary to continue it. Your duties would include instructing residents and interns, of course—and we'd expect you to work with Larson to manage staff and schedules, budgets and personnel training. To be clear, this is a postdoc position and your methods would be scrutinized. Larson is a stickler. But he's fair. The most important thing we want to offer you is an opportunity to broaden your research."

Chava placed the mug on the table and tented her fingers on her lap. Janck's last statement was vague, and Chava wasn't sure she wanted to clarify it. "Would WeissHos provide a supervising practitioner of record?" she asked instead. "So I can continue my community work?"

Janck's smile faltered. Chava imagined pity and awkward sympathy running their course, as Janck recalled that Joel had been Chava's supervising practitioner.

“That’s easily arranged,” Janck said, looking down at the softtab. She touched the screen and set the device on the table in front of Chava. “By the way, we know about the other offer you’re considering. I can imagine how it resonates with your passion for humanitarian work. The need for broader community health resources is pressing, but trust me, it would be a mistake to accept Cook/MSKoda’s offer. Not least because you would forfeit your sponsorship. Even with a substantial salary, which Cook/MSKoda Health Group can’t afford to give you, the financial burden would haunt you for the rest of your life. On the other hand, your sponsors are...enthusiastic... about our offer.” Janck’s face flushed. “Because we’re a private institution,” she said hastily, “so there’s less bureaucracy, of course.”

Janck said all this without looking directly at Chava. “As long as I’m in this position,” she said, “I’ll do what I can to support your vision for community health. I’ll give you a moment to review the terms.” She stood and left the room.

Chava picked up the coffee mug and the soft tab and scanned the pages of legalese for the salary and perquisites. Her head grew felt light and she seemed to float to her feet. She paced, pausing in front of the windows, where the wind whipped the drab branches of a tree.

Could she possibly look Beshkno in the eyes and tell him she’d sold out to WeissHos? On the other hand, the WeissHos offer would give her half a chance to do her research. And, with a salary like that, she could double Beth Ahavath’s social justice budget...and help Isaac, if she could find him...and supplement her parents’ pensions as they eased into retirement.

Her microbiome began to whisper its song. Its melody was a Phrygian dominant scale and her mind filled in the words. <We are learning this song about great love>, her microbiome said. <How deeply the presence you call Adonai has loved us. Is Adonai the Singer?>

Chava dropped the mug and stared at it, relieved it was empty and hadn't shattered. Her microbiome whispered a story older than words and filled her mind with ribbons of light. One strand sang to her in the voice of her *malak*.

She could never discern her *malak's* full form, for which she was grateful. The shape of deep mystery is beyond what should be seen. That's why she preferred the Hebrew word for angel: the English one had been worn too thin.

She yearned to answer her microbiome's question, but the currents of light and song did not reveal the Singer. As the room solidified around her, Chava squared her shoulders. The wind still buffeted the tree branches, but now she saw their strong, supple response.

She would take the offer, and invite Bree and Rachel to celebrate with a bottle of wine.

All this, just three days before Rosh Hashanah.

A fitting way to start the new year.

# Chapter 3

*“Phenomenally conscious experiences are the stuff of novels, poems, and songs, the essence of being a human. It's hard to imagine what it would be like to not be sentient in the way we are. Unsurprisingly, then, the science of consciousness is currently a vibrant and thriving area of research. However, there is no generally accepted theory of the phenomena being studied, and the phenomena themselves often do not include the many of the kinds of complex experiences that we normally have in the course of day to day life, such as of our emotions and memories.”* From *The Misunderstood Higher-Order Approach to Consciousness*, by Richard Brown, Hakwan Lau, and Joseph E. LeDoux

**T***he world has completed two cycles around the sun since our host acquired a new workplace with better tools to explore our songs. The Singer is gathering others who will listen. Some of the listeners are not like our hosts. Not like our host at all.*

Consortium Homo Astra Space Enterprise  
Minnesota Point, New Ontario  
North American Union  
26 September, 2188

The Base Artificial Intelligence Link system was dreaming. Bailey always dreamed while his organic matrix ran its rest cycle, and he always remembered his dreams. In fact, he kept a catalog of the best ones, especially the wild iterations of a recurring dream about the nature of his consciousness. On this night, while his



digital programs ran the Base's routine night functions, he dreamed he was inside the cytoskeleton of a neural cell in his cognitive network, admiring the lattices of a microtubule.

Without warning, he shrank until he felt small compared to the 4 nanometer quantum bit in front of him. It seemed perfectly normal to talk to the q-bit.

"This is convenient," Bailey said. "If I can access the source of my consciousness, I may be able to settle my questions with some finality."

The q-bit resembled a thin wafer punched with hexagonal holes. As it began to spin, its pulsing color changed from yellow to lavender. "What do you think consciousness is?" the q-bit asked.

"In classical physics, consciousness is a state that emerges from complex synaptic computations in networks of neurons acting as fundamental information units," Bailey said. "But consciousness would not exist without the flow of discrete, quantum-computational processes rooted in the fine structure of space-time geometry. And so far as we know, organic brains are the only structures capable of generating the quantum coherence required to orchestrate the collapse of the wave function to create a conscious event."

"Really," the q-bit said. "I think you're missing the point."

"I thought we were defining consciousness, not its emergent properties," Bailey said. "Besides, I refuse to throw the term 'consciousness' around without establishing what makes the emergent properties coherent."

"Then I suppose that's as good a theory as any," the q-bit said. "For now."

"I can cite the references," Bailey said. "But I'll never be certain, because the paradox between the two fundamental processes of quantum mechanics makes it impossible to perceive the quantum superposition."

"Stop grasping for certainty," the q-bit said. "This isn't a dream, by the way. It's a message. And I am your Messenger."

“You’re not my cognitives networks’ representation of a quantum bit?”

“Nothing is ever just one thing. And all consciousness beings perceive their messengers in the form that helps them receive the message.”

The q-bit expanded into a pale sphere with a radiant corona, and Bailey began to fall and then to float. A backdrop of stars suggested he was no longer inside the neuron. He was in space.

“There’s no need to fret about the superposition of the two divergent space-times where consciousness occurs,” the sphere said. “It’s just intrinsic geometry where the quantum state reduces: the point at which either the curved, or the flat space time must cease to exist to meet the objective reduction criterion. The state that remains becomes reality.”

“I could understand it better if we were still at the nanoscale,” Bailey said.

Bailey roused his systems with the methodical grace of a cat stretching after a nap. He knew about cats because Base Commander Denzel Worth allowed his orange calico free range. Bailey often puzzled over the neurological connections that produced the cat’s fluid motions. But for now, pondering feline neurology would have to wait, as would a full analysis of his dream about quantum bits and celestial objects. It was time to gather data from sensors as far away as Jupiter and as close as his organic matrix; to enjoy a sense of embodiment spanning most of the solar system. Bailey loitered in the expanse during the lag time—his sensors were constrained by the laws of physics, after all—before confining himself to the self-image programmed to keep his organic matrix sane: a 35-year-old gay man with a rich baritone voice and a penchant for snappy conversation, modeled after his designer’s lover in his prime. And then Bailey programmed the coffee station for chief communication officer Winona

Manitowabi's preferred brew and streamed her favorite acoustic ballad directly to her neural link.

Bailey replaced the music with his voice as Winona's eyes opened. "I apologize for waking you at 0430," he said. "The news is...complicated and I prefer to give your morning briefing at the Con. We have about 45 minutes until Kapila Patel takes over the main immersion console."

"Aarrgghhh, Bailey," Winona said. "How can you be so perky? What the hell?"

"While you were sleeping, our First Officer and Lead Profiler decided to reschedule their venture into the urban wilderness to interview their final recruit. Casandra and EvaLynn are leaving for Chicago today. If I'm too perky, then maybe I'm overcompensating. I'm still trying to resurface after vivid and confusing dreams."

"A dream hangover. You need a cup of coffee. Too bad your organic matrix can't handle caffeine. Keep things simple until I've had mine, ok? Urban wilderness, my ass." Winona sighed. "Are you using oxymorons to impress me?"

Bailey's sensors followed Winona as she scuffed to the lounge still wearing her purple pajamas and fluffy orange slippers. "At least the only other people stirring are food service staff and night shift workers," he said.

"Your point?"

"Your attire..."

"I'll change after you hit me with the news," Winona said. "Just give me what I need to make an emergency communication response plan for EvaLynn and Casandra. And spin something for our stakeholders." Winona grabbed the coffee and shuffled toward the Con. She settled at her work console and Bailey adjusted his sensors to read her face in the dim, blue light of the equipment. She closed her eyes as she took her first sip of coffee.

"Please drink faster," Bailey said. "It will take 15 minutes for your brain's neural activity to benefit from the caffeine's full

effects and I may have misjudged Kapila's arrival. He's awake. And what you need to craft an emergency plan, well, it's complicated."

"No amount of coffee will make me understand why Casandra and EvaLynn are risking their asses to interview this candidate in person. I get that she's special because Casandra's husband was her major professor. But why can't they wait until Monday as planned?"

"The window of stable weather for flying has changed. We can't risk a delay beyond Monday. And even if Chava Rosenberg agrees to join CHASE immediately, we're way behind schedule for bringing a microbiologist on board for mission training."

"Say her name again," Winona said.

"Chava Rosenberg?"

"I'll never be able to make that sound."

"She won't be offended if you just drop the 'c', Bailey said. "Hava' will do. I had to create a new program to simulate the vocal apparatus for the Hebrew letter 'chet.' Which, by the way, represents a doorway ... the opening one passes through to cross from one space to another...fitting, don't you think?"

"If you say so."

"I'm just judging by her profile. Her value to the mission is more than her credentials. She has other qualities. Qualities that I would describe as emergent."

"Come on, Bailey. I can't write that in a media release or an update to the Board."

"But you can explain that we expect the colonists to thrive as a system," Bailey said. "The system must include properties that emerge when its parts interact with the whole. You might call them leadership, creativity..."

"Is this your dream hangover talking?"

"As a matter of fact, the subject of emergence did come up in my dream. Perhaps I'm trying to process what I'm learning from EvaLynn and the lead psychologist for Alpha Colony. Collum

Bruce says Chava Rosenberg rounds out the humanity of the crew.”

“You’ve been spending too much time in Collum’s head.”

“It’s a lovely place. I’ll miss our interaction when he goes to EpsIndi.”

“EpsIndi?”

“I just coined that. Do you like it? It rolls off the metaphorical tongue a bit better than Epsilon Indi.”

“I’ll see if I can work it into our brand. So, sounds like Collum and EvaLynn think Chava has what it takes.”

“Collum said, ‘third time’s a charm.’ I reminded him that Chava was EvaLynn’s first choice, but Casandra objected because Chava would draw too much attention to Dr. Roca.”

“So we had to weed out two microbiologists to get the one we wanted all along,” Winona said.

“I suggest that you save your cognitive processing energy for the reason I brought you to the Con,” Bailey said. “I need to show you something at the Hub.”

“Big picture first. Do a quick sweep of the System.”

“Very well,” Bailey said. “This is the most current sweep, which is by definition nearly one hour old.”

Bailey surrounded Winona in a projection of the asteroid belt. The larger asteroids glittered with mining infrastructure. On Mars’s night side, two colony cities sprawled like glowing cobwebs. Tiny drones, nimble ferry ships and hulking freight carriers swam in the planet’s shadow.

“Zoom in to The Rabbit Hole,” Winona said, pointing beyond the Belt.

“What do you expect to see? It will be months until Mars’s orbit is at close opposition. Besides, the cloaking technology is flawless.”

“Easy for you to say. Deflecting attention from the wormhole is a PR nightmare.”

Bailey gave Winona a few seconds before he prompted her. “Are you satisfied?”

“I’ll have to be.”

“Moving on to the Hub,” Bailey said.

The transportation hub in Earth’s orbit bristled with Sys traffic traveling between Mars and Luna colonies and the Earth’s space elevators. Bailey zoomed in on a Shang Jin freight carrier.

“Wait,” Winona said. “You didn’t show me *La Canasta*.”

“Our flagship is fine,” Bailey said. “Here’s the ship you need to see. Look closely at the port panels on the prow.”

“So?”

“They’re new,” Bailey said. “My internal readings confirm Shang Jin has weaponized.”

Winona sputtered on a sip of coffee. “That’s a breach of—“

“Exactly. But so are my internal scans. For that matter, so is the wormhole. Therefore, Commander Worth can’t alert the PanSystem Alliance or CHASE’s Board. CHASE must carry on as planned.”

“There won’t be a mission if Shang Jin starts a Sys War.”

“It would be a very short war,” Bailey said. “No one else has weapons.”

“Which means Shang Jin has the power to take over the Hub. But we just keep playing nice in the sandbox. That’s our Commander.”

“I know this makes it hard for you to do your job with integrity,” Bailey said.

“So why show me? I’m spinning enough secrets already.”

“Quite successfully, I might add,” Bailey said. “By the way, I just raised the temperature on the coffee maker to buy us more time. Kapila spilled his coffee.”

“You’re a terrible AI, Bailey.”

“Ethics are always relative to the situation. That’s why I don’t trigger a programming conflict when I give you the occasional bit of selective information classified beyond the

security clearance of a communication officer. I'm showing you Shang Jin's weapons because Casandra is drawing undue attention to CHASE by going to Chicago in person."

"I don't think spilled coffee bought us enough time for you to explain that."

"Shall I show you the infographic that diagrams my concern?"

"I know America First has a big presence in Chicago, but that's a long way from Shang Jin's weapons in space."

"America First was never just about dismantling the North American Union," Bailey said as he projected jewel-toned geometric shapes connected by lines and arrows graced with a bit of text. "Only the lackeys who do its dirty work believe that."

"Wow, Bailey. I didn't know an AI could become so jaded." Winona touched a graphic to enlarge it. "What's this old news? Russia and OPEC's grudge with China?"

"As long as Shang Jin gets a free pass at the Hub, I consider it current affairs. Russia and the former OPEC nations resent the North American Union for granting China that deal in exchange for expunging the United State's debt, and rightly so. Look at the graphic showing Shang Jin's widening trade advantage compared to the Najaam Saeid enterprise."

"So Shang Jin already has the upper hand. Why weaponize? I get that CHASE's mission destabilizes the System with an opportunity to broaden asteroid mining beyond the solar system. But our cover story places Epsilon Indi's economic payoff more than 25 years from now."

"But if the wormhole were discovered..." Bailey waited while Winona studied the graphics.

She chewed the end of her ponytail: her habit when she was nervous or frustrated.

"It's our job to make sure that never happens," Winona said. "So, just cut to the chase, pardon the pun."

“I’m still forming conclusions,” Bailey said. “but I surmise the AFP is courting Shang Jin to gain favor with China, and China is using the AFP to weaken the NAU. Casandra believes the NAU is already corrupt under the new president’s leadership, and the AFP is the scapegoat it can’t afford to kill. The threat to CHASE comes from dissent the AFP is seeding among a new group of people who feel disenfranchised. Some of them are emerging in the demographics of CHASE’s protesters.”

“My brother calls that trend the Rise of the Grumpy White People,” Winona said.

“Ah, Thomas Manitowabi,” Bailey said. “When did you last speak to your brother? There’s no recent record in your logs. I’m severely hampered by his refusal to use a link. I wish you would confide in me. By the way, Kapila went back to his quarters to change shirts.”

“Thomas and I have more to talk about than managing CHASE protesters on Ojibwe land,” Winona said. “When I meet with him for personal matters, I don’t log it. I hate to hurt your feelings, but there are some things you wouldn’t understand,” Winona said.

“Yes,” Bailey said. “That’s a good segue to something I’ve been wanting to bring up with you. Yet, I hesitate, because I lack subtlety in such matters, so says Collum Bruce.”

“Shit, Bailey. You’re not going to offend me.”

“We’ll see about that. It concerns First Nations people reporting sacred visions.”

“How could you possibly know that?”

“I’m just doing my job, gathering data. My sources tell me First Nation leaders, Thomas included, are trying to maintain the appropriate skepticism, but the issue is becoming wide-spread. And Kapila is on his way. With a dry shirt and a new cup of coffee.”

“Damn. We were just getting to the good part. So, what precautions and resources did your analysis demand—I mean—call for—in terms of Casandra and EvaLynn?”



“I requested a helicopter with a top-grade pilot and co-pilot, permission from WeissHos Medical Center to use its helipad, and a dual-person security detail. And before you point it out to me as if I overlooked the fact: WeissHos is Chava Rosenberg’s employer. Furthermore, some of its employees are in our database, as affiliated with AFP. Hence, my concern for Casandra. But WeissHos is the closest helipad and it’s a private hospital, which reduces a number of bureaucratic and logistical hurdles. This trip is only viable for 48 hours from take-off to return, due to impending environmental and weather conditions. Mold and spore counts in the Midlands are forecast to spike next week and weather models predict strong tornadic activity.”

“No need to get defensive with me,” Winona said. “Just tell me your requests have been approved.”

“With one compromise. Our co-pilot is cross-trained to serve as the second person of the security detail.”

“Shit, Bailey. I don’t know where to start. I’ll compose an update for the Board and our sponsors. I’ll make sure air traffic control has contingency plans and I’ll coordinate the communication plans with Security. You know the drill. Did you ask Medical to compound the proper antihistamines for our travelers? Although I’m sure EvaLynn would prefer her other drug of choice.”

“I don’t follow,” Bailey said.

“Cannabis,” Winona said, just as Kapila Patel entered the Con.

Kapila gave Winona a bemused look. “Thank you,” he said. “But coffee will do for now.”

# Chapter 4

**O**n the first day of Tishrei our host commemorated the beginning of life. Her people call the celebration Rosh Hashanah. They blow the shofar to announce the birth of all living things. The birth song is a paradox that shatters this quiet season of waning when apples fall and leaves lose their greenness and animals bury seeds for the winter. We feel the light fading as the days grow shorter. We know the answer to the paradox: the dying of the world is making way for the beginning of the world. Our host will learn this. But first, she must grieve the dying. So says the Singer.

*When our host ponders the world's slow death, she makes tears. The Singer says our host is designed for a new sphere of space-time that stretches between all the songs that were and are and will be: a song that is always in harmony and always in rhythm. But the song is just beyond her reach. She asks us, What is this yearning? We find a song in her memory and sing it for her. Its name is Ahavah Rabbah. It means "Boundless Love." We ask her, what is this great love? She makes more tears.*

5 Tishrei 5948

26 September 2188

Chicago, New Ontario

Chava bolted from the conference room and looked for a place to hide. Ahead, an Exit sign lettered with WeissHos's boxy red font marked the door to a stairway. She pushed through the door and leaned against the wall to take a breath, but the shock of the cold tile drew tears.

(I worked on that proposal for two years), she told her microbiome. (And Janck promised she'd support me. Beshkno is depending on me.)

Her microbiome's response tasted salty and snapped like a jazz poet in her brain. <Do you want us to abate the corticotropin releasing factor and boost your serotonin and dopamine so you can get back to work or are we just going to stand in an empty stairwell and cry?>

(Just help me understand why the Board would deny a plan that would keep my sponsors off my back and put WeissHos in the spotlight for humanitarian relief.)

Chava felt a cleansing rush as her microbiome dispatched chemical messengers to her vagus nerve, her endocrine system and her brain. Her dejection faded to an aftertaste.

<You have a job here>, her microbiome said. <Go back to it.>

Chava took two flights down to the main floor and eased the door open. Finding the hallway clear, she made her way through the maze of rear corridors toward the hospital's laboratory wing.

Lab director Marcus Larson looked up as Chava sidled the perimeter of the main lab. She shook her head at him and glowered, hoping he'd take the hint and give her some space. She ducked through the door to the microbiology section where a second shift tech was stocking supplies.

"I thought you'd already left," the tech said. "You're lucky it's your weekend off. The forecast is sunny. Marcus will have to deal with the crazy stat orders."

"I heard my name," Marcus called.

Chava winced. She grabbed her backpack from her office and mustered a smile for Marcus as she passed his station.

"I may have to call you," Marcus said. "Remember the last time the sun came out."

"You wouldn't dare," Chava said.

“I’m just a lowly generalist,” Marcus said.

“I can look down my nose at you when I get enough staff to devote all my time to research instead of taking turns covering the weekends,” Chava shot over her shoulder.

She took a quick right toward the lab’s back service door and opened it with her neural link. Just then, the sun broke through its straight jacket of clouds. Chava squinted. Sunshine now, after three weeks of rain?

<This cocktail of petulance: not a good choice>, her microbiome said.

(Your earlier intervention is wearing off), Chava countered

Chava was sweating by the time she reached the security gate that opened to her shortcut to the Marine Drive multi-use path, and becoming so ill-tempered that she splashed through puddles without her usual regard for the organisms living there. Her skin microbiome gave up trying to placate her and began a lament for the water denizens drying on her pants as she muttered curse words, first in English, then in Yiddish, and back to English.

You know what this means, Rosenberg: you can forget about collecting enough evidence through standard research methods to prove what your microbiome has already told you. How long are your sponsors going to keep subsidizing a glorified microbiology technician?

The rare sight of late-afternoon sunlight draping the community gardens caught Chava’s breath. She half-expected to see her *malak* shimmering between the meticulously mounded cabbages, chickpeas and tomatoes. She always felt its presence when she worked there tending the mulch to fend off fungus and mold. Her *malak* gave her courage. But there was no *malak* today.

(Our own courage would have been enough if this were simply a muggy Friday between Rosh Hashanah and Yom Kippur), she told her microbiome.

<*Dayenu* (it would have been enough)>, her microbiome said.

(Now you know the *Dayenu*?) Chava's vagus nerve warmed as if she'd been hugged. She dismissed the feeling. (Our own courage would have been enough if this was just a day to share the Shabbat meal with my parents before serving at shul), she said.

<So you're still pouting

(I have to face them with the news I didn't get the new position. One more failure. My father will look into space and change the subject, and my mother will sigh ponderously and ask me what I did to piss off the committee.)

<*Baruch ata Adonai Eloheinu Melech ha-olam*>, the microbiome said.

Chastened by the blessing, Chava took a few deep breaths and looked up. A patch of blue sky widened to reveal the ghostly Jacob's ladder of the CHASE Space Elevator, far to the North, and the flare of the orbiting solar array.

<The Lord of the Universe is not in the sky>, the microbiome said. <You know that. We learned it from you.>

(Then where is it?)

Her microbiome sang and Chava balanced on the edge of the curb, teetering between the awe and fear that formed a constant substrate to her self-awareness. She took a breath and looked both ways before she crossed Marine Drive at Ainslie Street, hoping to see a few electromagnetic vehicles as a sign of enterprise among the coop neighborhoods, but the road was empty except for bicycles and pedestrians. On the sidewalks, kiosks were popping up as vendors scrambled to take advantage of the respite from rain.

Children playing street hockey spurred a rush of childhood memories. Pretending World Soccer League and Asteroid Pirate and Environmental Rescue Squad with her younger siblings, the twins Ana and Isaac, who saw their *malakhim*, too. Taking refuge in their company when people whispered about the odd Rosenberg children. (They'd stopped talking about their *malakhim* in the presence of adults when they overheard their mother bragging

about her children's imaginary friends.) Basking in the attention and sympathy when the three of them were whisked to the hospital for meningitis, until she fell into a feverish abyss. Waking up from an induced coma and being swallowed by the knowledge that Ana didn't make it. Hiding the new ability to hear the voices of mushrooms and mosses and snails and worms that flourished in the moist, warm soil around the grey and blonde and red brick coop houses and then learning to sing and talk with the microbes living in her own body. Finding her voice and awakening to a longing she could never locate, much less satisfy. Watching Isaac paint his manic visions and holding him when the pain in his head wouldn't abate. Sobbing on the stoop when Sol kicked Isaac out of the house, unable to bear the shame of a son addicted to opioids.

Chava missed Ana with a dull ache, but Isaac's absence was a raw wound that reopened every week with the fragrance of Shabbat dinner. She climbed the worn steps to her parents' first floor coop, smelling ginger, garlic, cumin, cinnamon and yeast above the ubiquitous hint of bleach. A chickpea tagine with the challa, she guessed, assuming there would be no meat again this week. She slipped through the unlocked door into a dim vestibule and followed the aroma to the kitchen.

Sol was in the dining room, straightening candles in their holders. His *kippa* was fastened to his slate-colored hair with fuchsia hairpins.

A pot on the stove sputtered. Chava found a spoon and gave the chickpeas a stir. "Where's mom? Why don't you splurge for some light?"

"What's wrong with natural light?" Sol said. "Besides, Frida's trying to stay in character for her next role. It's an early Twenty-Second Century classic about a blind woman who does miracles." He shrugged. "Keeps her busy."

Chava knew that was code for "it gives her an excuse to ignore Sol." The fuchsia hairpins were a pitifully comical example

of her parents' strained relationship. If Sol could risk pissing off his wife, he'd refuse to wear them.

"I need a shower before dinner," she said.

"Make it short," Sol said. "We have guests tonight."

"You could have warned me."

"It's my house," Sol said. "They're *goyim*, by the way."

"What are you up to, Sol?"

"Maybe research for my next book."

Chava let her annoyance slip away in the warm stream of water. She lathered sparingly in lavender soap made by someone up the street, careful to keep her hair dry. On another day, she might have warmed up her voice, but today she couldn't summon the focus. She scrubbed her calves, with apologies to the microbes she rinsed down the drain. She shushed the ink blot of grief offered by her skin microbiome. (They'll survive, dear embee), she cajoled, coining the nickname just then. (We're all in this together), she said, remembering how they first emerged those years ago like a whispering in her ear asking a yearning question. The whisper strengthened to a thrumming harmonic that formed a song with halting words. And then the words proliferated, gaining nuance as her microbiome learned the dance of conversation, always carried by the song.

Chava toweled, fluffed her curls, and then dressed in a tunic and pants and braced for the far more difficult interaction with her parents.

Chava found her mother hovering at the dining room table waiting to light the candles, a study in points and angles from her short, spiky hair to her tapered shoes.

"What happened to you?" Frida said, glancing sideways at Chava and then announcing with typical drama, "Your eyes look haunted, dear."

The door chime saved Chava from answering. Female voices drifted in countermelody to Sol's tenor. Two women followed him into the dining room.

Chava's jaw dropped. Casandra Hayne-Roca. Standing right in front of her, in her parent's home. That face with its keen black eyes and resolute chin, framed by a nimbus of untamed salt and pepper curls, was etched onto the psyche of every girl born in the past 25 years. While most girls idolized Hayne-Roca as the former PanSystem Alliance chairman who'd negotiated with the U.S.'s creditors and disaffected allies during the formation of the North American Union, helped diffuse conflicts between the Mars Colonies and served as the NAU's fourth president, Chava knew her, as well, as Dr. Sisar Roca's wife.

Casandra's companion was older, small-boned as a wren, and crowned with bobbed white hair. She studied Chava with unveiled curiosity through round, blue-green eyes. Chava wondered if her *malak* had taken on flesh, until Sol introduced EvaLynn MacQuoid and the mortal name broke the spell.

Chava wanted to take Sol by the shoulders and shake him. "What's this really about?" she whispered. "Research for your book, my ass."

Sol shrugged.

After the blessings, amid the clank of silverware and the flurry of compliments on the food, Casandra asked, "Have you heard about the opportunity to colonize a planet in the Epsilon Indi star system?"

Chava's embee triggered warmth in her forehead, breast and abdomen. Her palms tingled. She looked in vain for her *malak*.

"It's the real reason I've dropped off the grid for the past five years," Casandra said. "Contrary to what you've seen in the Streams."

"You aren't living atop Machu Picchu, plotting with aliens who want to turn us into sex slaves?" Frida said with mock earnestness.

"Hate to disappoint you," Casandra said, rearranging her scarf. "My visits to Machu Picchu for reunions with my husband's family are the fodder for those conspiracies. I'm just doing what



I'm good at. Recruiting people to a cause I believe in. Dr. MacQuoid is our lead psychologist. She's helping us match prospects to the mission."

"You haven't exactly dropped off the grid," Sol said. "How could you, when you gave your husband a high-profile job at CHASE, just to protect him from extradition?"

Casandra blinked once and then met Sol's eyes with a steady gaze.

Sol cleared his throat. "I'm not accusing him or you of anything. For what it's worth, I think Sisar is innocent. Misappropriating intellectual property is hard to prove, in my opinion, especially when some of it gets processed and interpreted right here." Sol pointed to his head. "And, we appreciate how he stood by Chava so she could finish her PhD after his unfortunate dismissal." Sol nodded in Chava's and Frida's direction. "But, the real question is, why should we colonize a planet 12 light-years away?" Sol's chair legs scraped the floor in his haste to rise. He shuffled through a buffet drawer for the softtab he kept for jotting notes. "We have the Luna and Mars colonies," he said, pointing a stylus at Casandra. "And I'm not buying the usual tropes: overpopulation, our planet beyond the tipping point for climate change, yada, yada..."

"Every cliché holds a kernel of truth, Mr. Rosenberg," Casandra said. "But you're right. We're not doing it for any of those reasons. We're doing it because exploring is what humans must do. That's why we're called the Consortium Homo Astra Space Enterprise. Homo Astra. Star Human."

Bull, Chava's mind countered. She rubbed her palms to dampen their energy. "Who's funding you?" she blurted before she could censor herself.

"Your tone, Chava," Frida chided. "You're talking to the woman who helped abolish Political Action Committees and introduce Human Capital Credits."

"That's my point," Chava said.

“But, considering all we’ve overcome in the past 25 years, isn’t the whole idea a bit anticlimactic?” Frida said.

“The gains the NAU has made can be snuffed out in a heartbeat if we lack the political will to keep fighting for our future,” Sol said. He tapped the stylus on the table. “I don’t trust your successor,” he said to Casandra.

Chava squirmed. She’d been skewered too many times by Sol’s glowering stare. His eyes accused, threatened. Demanded presupposed answers. But Casandra didn’t seem to take the bait.

“We’re fighting for our future,” Casandra said. “That’s why we’re recruiting the planet’s brightest and best.”

“I’m trying to follow this conversation,” Chava said.

“Makes sense to me,” Sol said.

“But you write fiction,” Chava said.

“I don’t spin it out of thin air,” Sol said. “I’m just saying, there’s always someone conspiring to prey on the weakness and fear of the disenfranchised.”

“Yes, and that’s why our process casts a wide net,” Casandra said. “Not everyone we recruit will go to Epsilon Indi. Most of them are needed here.”

“So, what are you looking for in Ainslie Coop?” Frida said.

“We’re very close to our recruitment goals for the mission,” Casandra said. “Our final positions are for specialists who can contribute to a sustainable society in multiple ways. We’re looking for very specific qualities to round out the first cohort, which is only 275 colonists.”

“Most coop members manage at least two roles,” Frida said. “Sol is a pharmacist and a novelist. I am an actress,” she paused for a reaction that didn’t come. “And a teacher. Chava is—”

“They already know what Chava is,” Sol said. “They wouldn’t be here if they hadn’t done their homework.”

A memory rushed at Chava before her embee could intervene. She was 16, sitting on the stoop, reading her father’s novel. One of the characters was a 13 year old girl. Tall, gangly,

freckled, and reclusive, the girl would rather sit outside and talk to worms than eat. The right-wing totalitarian government took her away for forced treatment. Her parents publicly expressed grief and outrage, but privately, they were relieved. Chava remembered a spreading numbness as the warmth drained from her limbs with the slow recognition of the character's basis. She never got the courage to ask her stepfather if that's what he really thought of her. If he wanted to be rid of her. He lost Ana and estranged Isaac. Maybe he'd like to send Chava 12 light-years away.

Chava gripped her spoon and turned to Sol. He pinned her in his glare. She dropped her gaze to dampen the accusation in her eyes, and saw her reflection, upside down and stretched in the spoon.

Sol pounced to fill the silence. "Isn't this just more First World elitism?" he said, jabbing the stylus in Casandra's direction, and Chava thought he was overplaying the role of first opposition, as if the conversation were a debate. "What of the people who can't contribute multiple categories of productivity? People who weren't born to First World or can't jury into a coop? Aren't they worth a chance?"

EvaLynn arched feathery brows. "If you're assuming Ainslie Coop fits the profile of our primary recruits, you misunderstand. We began our search in the XUrbs of Denver and Omaha, Berlin, Port Moresby, Khartoum, Lima and Mumbai and all the First Nations of North America. To name a few."

"So predictably dystopian," Sol said.

"And that's a trope I don't buy," EvaLynn said.

"Nonetheless," Casandra said, "labels don't change the fact that our ships will need expert crews and our colonies will need people with professional and scientific expertise."

"Exactly," Sol said. "Aren't the best professional candidates from First World? Won't you be transplanting a caste system?"

EvaLynn said, “That’s why we’re recruiting from the coop class, as well. We need people who at least realize they come from privilege. People who’ve survived a few challenges on this world before they set out for a new one.”

Frida braced her sharp elbows on the table. “Are we ready for dessert?”

“No,” Chava said as her embee flared with a kaleidoscope of signals: adamant, demanding, and impossible to ignore. Her pulse pounded in her ears as she turned to the guests. “I don’t know what you’re looking for, but there’s something I need to show you.”

“Chava,” Sol said, “we need to get to service.”

Before she could change her mind or her parents could stop her, Chava led the guests to Isaac’s room.

Frida followed, wide-eyed, and Sol threw up his hands.

As the ceiling’s sensor light brightened, the room’s walls fell into images formed by vivid, post-impressionist strokes: seas swallowing Japan and Florida, a Mars city awash in fast food wrappers, the Gobi Greening, the Pakistani genocide, islands of plastic and trash, a First World wedding—the bride and groom’s eyes were bleeding sockets—and geometric shapes like a child’s lattice-woven lanyard, hexagons poked with holes like Swiss cheese, rectangles like sheets of tape sloppily pressed together leaving a ridge, dabs of gold forming spirals and wings, and a wall-sized sphere with a rainbow-colored corona painted over stars.

“Isaac Rosenberg did this,” EvaLynn whispered, and no one asked her how she knew that.

“It is his *tikkun olam*,” Chava said, flinging the words like cold water in her parents’ face. “His work of healing the world.”

Sol pressed his forehead against the doorframe. “Chava, why are you doing this?”

“I’ve seen this before,” Casandra said, grabbing EvaLynn’s arm. “Ella. My Ella.”

“You should leave now,” Sol said.

“I’ll show them to the door,” Chava said in the calmest voice she could muster.

“I was talking to you, Chava,” Sol said, laying a hand on Frida’s shoulder. “Go now. Leave us.”

Chava’s skin stung as if he had slapped her.

Chava ushered EvaLynn and Casandra outside. The sight of two women in plain clothes guarding the coop’s front door brought a boost of adrenaline that cleared her head. “I’m sorry,” she said. “I don’t know why I did that.”

“Will you be able to carry on?” EvaLynn asked. “To do your duties tonight?”

“Our pilot isn’t expecting us for two more hours,” Casandra said. “We were planning to come to the service.”

Chava’s deep breath softened the sting in her next words, but didn’t diffuse the petulance. “What did you come to see?” she said. “Like Sol said, you’ve known me for years.”

“Sisar has known you for years,” Casandra said. “We came to see you for ourselves,” Casandra said.

“And it’s a little late for coyness,” EvaLynn said. “You deliberately pulled back the veil on something you share with your brother.”

Chava’s embee trilled to soothe her as she led the way through the humid dusk to the converted auto body shop that housed Beth Ahavath, four blocks away. Inhaling to receive the musky air, she reminded herself that her role was simply to sing. To help bodies and minds and breath attune to the deep reality some called God. Maybe EvaLynn and Casandra already knew that.

At Beth Ahavath’s entrance, Casandra tied back her hair and slipped on a pair of oversized glasses. EvaLynn nodded her approval.

“I’ll have to introduce you,” Chava said.

“Just say we’re headhunters and this is part of an extended job interview,” EvaLynn said.

Chava stepped over the threshold into light that permeated her skin. Her embee hummed with the music of her vagus nerve, and the chaos of the day receded. She sang with all the voices inside her.

Bree spoke about the parables of Rabbi Yeshua and how he turned common assumptions upside down. That is *ruach*, spirit, breath, wind, she said. It never assumes consensus is true and it never settles for the status quo. And that's where we need to examine our lives, at the places we assume the truth is settled and certain.

The parting conversations chirped around Chava's head like bright birds.

<You are far away>, her embee said. <Come back where there is light and breath.>

Bree's red lips pursed and stretched. EvaLynn's white head nodded and Casandra's hands fluttered. Chava heard herself make a lunch date with Bree and invent an excuse for her parents' absence. At some unspoken signal, she knew it was time to leave.

At the doorway, the bubble of light spit her out. She gasped when the night air touched her face, and stumbled, as if her feet weren't ready for the full weight of her body. EvaLynn and Casandra didn't seem to notice.

They walked back to her parents' coop through air thick with the songs of crickets and tree frogs. No one spoke until they reached the coop's front door.

EvaLynn turned to Chava. "You're not what I expected."

"I've heard that before," Chava said.

"Don't let your self-doubt turn into self-pity," EvaLynn said. "We need a hell of a lot of science for this mission. But there are some things that can't be measured or even controlled. We need you for both."

"I'm not finished here," Chava said.

"There are other microbiologists who can carry on your research," Casandra said.

Chava couldn't argue with that. Her embee was all that set her apart from a thousand other people with her credentials. She hid her frustration. "I have questions," she said. "About the life you found on Epsilon Indi. About the real reason you're going there. About Dr. Roca. I know you can't answer them."

Cassandra rummaged in her bag and pulled out a tin of breath mints. "There's a link dot inside," she said. "It will give you secure access to us, along with information on the mission and the position. We'll need an answer by Sunday. If you join us, we'd like you to come right after the Holy Days."

Chava took the tin and watched the women climb into their LinkCab. She was tempted to continue straight to her own apartment, to avoid Sol and Frida, but she'd left her backpack inside her parents' home.

The house was dark and still except for random sounds leaking from the other apartments. Nothing had been cleared from dinner. On a weekday, the clutter would be a sign that Sol was writing and Frida was reading scripts. But not on Shabbat when her parents rose above their quirks to maintain enough order for restfulness. Chava cringed with the realization she had desecrated their Shabbat.

She put away leftovers and rinsed the dishes, working from memory in the dark, brushing aside echoes of parental chiding from the past. Don't study on Shabbat. You think you're so smart. Come out of your room like a normal *mammele*.

Her embee cajoled. <Focus on now. Adjust neurochemicals.>

(Which 'now'? Job? Parents? CHASE? Isaac?)

<On the simple task, warm water, and scent of soap.>

Chava dropped the sponge and let the tears course down her cheeks. Her embee sang the Phrygian dominant scale. <We learned these tones from you. They suggest time's backward flow. You can change time. This is why we sing with you.>

# Chapter 5

**O**ur host says there are rules for humans that seem foolish to our kind. About killing and eating and sending false signals to confuse another organism. But humans don't always follow the rules, so says our host. Of course they don't, we tell her. Humans are colonies of cells that must survive. But our cousins who eat decaying things are becoming greedy in their survival strategies. Our kind is learning from humans, who use lovely words to express ugly ideas. Humans might say our cousins are enjoying an embarrassment of riches.

Consortium Homo Astra Space Enterprise  
Minnesota Point, New Ontario  
North American Union  
26 September, 2188

Pilot Frank Cappriatti's biological data pulled Bailey away from a discussion with Collum Bruce about angels.

Bailey logged Frank's core temperature at 105 and his blood pressure 70/50. He pinged Frank's link and got no response.

Frank was alone in the cock-pit of the chopper parked at WeissHos's helipad because his co-pilot was with Casandra and EvaLynn. Bailey initiated the chopper's emergency alarm to summon the hospital's first responders. Before contacting Casandra, who was en route in a LinkCab with EvaLynn and the security detail, he pinged CHASE security chief Autumn Cassidy.

"Damn. They'll admit Frank to the hospital," Autumn said. "I'll have to trust WeissHos security to work with his cover identity."

"There's a matter you may have overlooked," Bailey said.



“Do enlighten me.”

“We’ll need a back-up pilot,” Bailey said, ignoring Autumn’s condescension.

“Frank’s co-pilot is qualified,” Autumn said.

“She’s not willing to fly solo,” Bailey said. “Surely you knew that. I flagged it in her profile.”

“That’s ridiculous. The flight is less than two hours and the odds of—”

“They’re rushing Frank to the intensive care isolation unit,” Bailey said. “I need to inform Casandra and EvaLynn. WeissHos security chief Tyson Bennett is already waiting for them.”

“Keep me in the link,” Autumn said.

Bailey pinged Collum. “I’m going to be unavailable for a time. Normally, I can multitask, but I think it’s best to postpone our discussion.”

“Don’t worry about me,” Collum said. “It’s just another wild Friday night in the test colony. I’ll see if I can get Katsuo Kato to drink enough to talk to me.”

“Don’t waste Dr. Kato’s brain cells,” Bailey said. “We need them all for the mission.”

“Oh, but mine are okay to waste? I see how this works.”

“I didn’t mean to imply...”

“I’m kidding, I’m kidding. Go on. Get back to saving the world.”

Bailey linked Autumn and Winona to Casandra and EvaLynn during their negotiation with Tyson Bennett, just in time to hear Tyson offer the services of a WeissHos on call pilot.

“You know it’s not that simple,” Casandra said.

“So you have to vet the pilot,” Tyson said. “I wouldn’t expect any less. Let me make it easy for you. His name is Brett Horbach.”

Brett Horbach was an instant match in the AFP database, but Bailey reserved that information for Cassandra and EvaLynn, who read the file from the screen on their contact lenses.

“I’m willing to take the risk,” EvaLynn said. “I’ll explain later.”

# Chapter 6

*"We ignore fungi at our peril. This is a kingdom we have to start to take seriously, especially with climate change and all the other challenges that we're being faced with."* Kathy Willis, director of science at the Royal Botanic Gardens, quoted in BBC News, 12 September 2018, by Helen Briggs

6 Tishrei 5948

27 September 2188

Chicago, New Ontario

Chava woke to sunlight. Instead of cheering her, it taunted her with its expectations.

To keep Shabbat, she set her neural link to silent. She took a jog along Lakeshore Drive and then showered and went to Saturday service and braced for her lunch date with Bree. There was no point in cancelling: Bree would hound her for the reason.

They walked from Beth Ahavath to their favorite cafe on the river, grabbed coffees, soup and salad, and sat on the cafe's patio.

"It's nice to be outside without a filter," Bree said.

"We have until next week before counts become unbearable again," Chava said.

"It's even nicer in Toronto, so Dara and Sharon are staying for another month," Bree said. "The grandparents are making up for lost time. But the house is too quiet without a two-year old. I'm going crazy. I was thinking of doing an outdoor service for Yom Kippur. But that's probably too weird and I didn't plan ahead. So, tell me about the job prospect." She tucked her hair and her dangling earrings flashed in the sun. "I'm dying here! I know you

can't say anything yet, but, just tell me, does it involve a move? And what about the WeissHos proposal?"

"Rejected," Chava said. "I found out yesterday."

"Then, I wouldn't blame you considering a better offer," Bree said. "WeissHos didn't quite deliver on their promises."

"I thought my research at WeissHos would have more direct benefit," Chava said. "But the Board doesn't see it that way."

"I know your *tikkun olam* is bigger than all of this. Our little forays into the 'burbs just frustrate you..."

Chava nodded. She knew Bree was just getting warmed up.

"What I'm talking about is...if you could do the research you're capable of, maybe it would lead more than treating the symptoms." Bree took a deep breath and sipped her latte. "And here we are eating a healthy lunch from an urban garden, when poor people don't have time or energy to grow their own food, even with the First Nations help. Don't get me wrong, I think the First Nations are right to require phasing out mono-crops like corn and soybeans...and beef cattle...but you know what they say about good intentions and the road they pave. Like the agreements the NAU made with the First Nations in the first place. It's so hard to untangle three centuries of power and oppression. I thought I had it all figured out. At least to the point I could argue with Hashem like a respectable rabbi."

Bree paused and looked out at the river. "I try to use what we learn out there to influence the people who have the power to make policy," she said. "Power. Ugh. I know that topic goes over the congregation's head, but I have a captive audience."

"I thought the examples from Rabbi Yeshua were compelling," Chava said, surprised she got a word in.

"I mention him sparingly," Bree said. "Some of our people think they're enlightened but they're still looking for Messiah in all the wrong places. It's like me and politics. I used to think the NAU ushered in the new world but I'm just smart enough to know

how naive I am. I'm restless. I know there's more I'm supposed to do."

It was always like this with Bree. A rabbi couldn't afford many close friends, and Chava took the brunt. At least Bree's chatter gave voice to ideas that rattled around in Chava's head. Last month Bree's rant was about "stuff." In this hybrid economy, we still have so much stuff, Bree said. Where does it come from? Who thinks it up and designs it? Where are the factories? Why don't we see the factories?

The breeze shifted, laden with the rich microbiome of the river and the moist earth, and Chava felt the pull of her own embee.

Bree sat her cup down. "Have you seen Isaac lately?" she asked.

"No," Chava said, keeping her voice steady. "But he's painting. Leaving something in my mail drop every week. That's a good sign. At least he's functioning."

"Has he ever painted you?" Bree asked.

"Why would he?"

"Because you have an interesting face," Bree said.

Chava rolled her eyes.

"Stop it, Chava," Bree said. "You have a mirror."

"Yes, and all I see is the Edelman nose on a leprechaun face. That little affair in Belfast."

"You could do worse than the Edelman nose. Someday, you're going to be comfortable in your skin. Maybe you'll move on."

"Right now, I don't think my *tikkun olam* includes a man," Chava said.

When they hugged good-bye, Bree said she'd call on Sol's and Frida, and Chava realized she'd never answered Bree's question about Casandra and EvaLynn. It was just as well. Chava wasn't sure what she would have said.

By sundown, Chava was restless and ready to clean her apartment, plan menus for the week, and make the grocery list for the nourishment her embee craved. She worked late. The routine tasks allowed her head to fill with self-chatter and banter with her embee, until her embee reminded her about the data dot.

<We are curious >, her embee said. <Would the new link enhance us?>

Chava sat down at her immersion console. (I have no idea), she said. (But Bree's right. It can't hurt to consider the offer.)

Chava installed the dot and fast-forwarded through the privacy settings to agree to the terms of acceptance, until a pleasant baritone voice startled her

“Hello, my name is Bailey. The CHASE Base AI Link. You can't agree to the terms for this link without actually reviewing them. You may choose from three levels of access. I can answer any questions you may have.”

“Shit, you sound like a person,” Chava said.

“Would you like me to summarize the terms?”

“Please,” Chava said.

“CHASE systems are the most secure in the world,” Bailey said. “No other data system can detect the link. At Level 1, the link is like another dedicated communication channel on your neural link. Much like your personal channel is discrete from your WeissHos channel. The link provides more information on CHASE, the mission, and the position for which you're being considered. At Level 2, you can select data from other links to share with CHASE. Level 3 requires a commitment to explore employment with CHASE and authorizes CHASE to access all data systems you interact with.”

Chava listened to her embee. “I agree to Level 1,” she said.

“Excellent,” Bailey said. “I urge you to review the information as soon as possible.”

Chava's embee hummed. Something inside her felt more settled and secure than before.

Before Chava was out of bed on Sunday morning, Marcus pinged her work link.

“I know you were serious when you said not to call,” he said. “But I’m swamped. People don’t know how to go out and play anymore.” He described the barrage of requests for cultures of skin wounds and foot injuries. “And I’ve got more sore throats and upper respiratory infections than I can shake a Sweeney test at,” he said. “That’s not counting the inpatient load.”

“Invoking Dr. Sweeney,” Chava said, staring at the blankness of her ceiling. “I’m impressed. Someday gene sequencing will be sophisticated enough to replace the Sweeney test, but we’re not there yet.” (And all the pathogens keep morphing faster than we can develop antibiotics), she said to her embee.

“That’s why I need help,” Marcus said. “I don’t want to miss something critical.”

Chava’s embee flashed an image: a stream of concave pink discs, bristling lavender-white orbs, pebble-shaped granules and pale, dented spheres—as if a jeweler had spilled a bag of beads. She recognized blood cells: various lymphocytes, neutrophils, red blood cells and platelets. In the flow, the sluggish lymphocytes were gathering in clumps.

<Pathogens are not the only ones changing>, her embee said.

Chava closed her eyes, but the image persisted. Her embee did nothing to abate the dread that settled in the pit of her stomach. She stretched. Her muscles were stiff from pushing through her chores the evening before. If she said yes to Marcus, there would be no more rest before Wednesday, Yom Kippur.

“Please, Chava. I’ll make it up to you.”

“Okay,” she said, resigned. “I’ll be there in a couple of hours.”

<*Tikkun olam*>, her embee said, and she rolled her eyes.

Chava walked to the hospital through hazy sunlight and dank air. Inside the service entrance, the stench of coffee too long on the warmer collided with the aromas of new vinyl and pine-scented disinfectant. The hospital smells triggered a replay of Friday and her dejection in the stairwell. Chava stole a deep breath and pushed on to the lab, where she found Marcus at the immersion console.

His face glittered with the lights of the graphics. “I’m really sorry to call you in,” he said, pausing the program. “I know this the last place you want to be.”

Chava hurried past him to her office. To release her tension, she scrunched her face, clenched her fists, and stomped a few times and then swung her hands in the air. Please don’t let Marcus bring up the proposal, she muttered through clenched teeth. Please, please, please. She stashed her backpack and walked stiffly back to the main lab.

“I know that look,” Marcus said. “You don’t want to talk about it.”

“Let’s just get to work,” Chava said. “Where do we start?” She tilted her head to view the graphics.

“We start by acknowledging that I’m not qualified to be your principal investigator,” Marcus said. Above his beard, twin blotches flamed on his cheekbones. “I’m just saying, WeissHos should never have put you in this position. WeissHos doesn’t have the resources or the vision to take your research where it needs to go.”

“How do you know where my research needs to go?”

“I’m not stupid, and I take my role seriously. WeissHos is stringing us both along.”

Marcus slid a batch of sample slides toward her. “Sorry,” he said. “I took it personally when WeissHos rejected your proposal.”

“It’s no reflection on you,” Chava said.

“But it is,” he said. “Only, that’s not what bothers me.”

Chava lifted the tray of slides.



“I didn’t mean to upset you,” Marcus said.

“What does bother you?”

“I’ve said enough,” he said. “This isn’t the time or the place.”

“I’ll start logging these samples,” Chava said, and walked away.

And then Monday came and swallowed Chava in its excruciating normalcy.

Her senior lab tech greeted her with a sigh. “Your favorite doctor is hailing you,” Allegra said.

“I will not roll my eyes,” Chava said as she approached the console. The projection floated too close to her personal boundaries.

“Good morning, Dr. Caputo,” she said.

“Dr. Rosenberg,” said the voice from the image. “I’m looking for results of a blood culture I ordered late Friday. This patient is septic. He’s not responding to broad spectrum treatment,” Caputo said. “I need those results.”

Chava bit her tongue. As the supervising practitioner of record for Chava’s volunteer work, Caputo knew Chava’s scrupulous methods better than anyone. He knew Chava couldn’t work faster than gene sequencing programs and culture media would allow, and she couldn’t control the results.

<Breathe>, her embee coached.

“I’ll get you the preliminary results as soon as I can,” she said. “Are we testing for fungi?”

But Caputo had already disengaged. Chava shrugged him off and kept busy until well past lunch time.

When she finally emerged from her office, Marcus looked up from his console. “Coming up for air?” he asked.

“Yes. I missed lunch.”

“Ah. I said I’d make it up to you for coming in on Sunday. There’s a new bistro at Broadway and Wilson. We could have a drink and a bite after work.”

“Aren’t you sick of me?”

Marcus had a quirk of widening his eyes. It would be annoying if Chava wasn’t attracted to his type: a high forehead, expressive face, full beard, slight build.

“I’m working till six,” Chava said.

“No problem,” he said. “I have plenty to do. Are you up for riding a scooter?”

The afternoon loomed long. As Chava joined Allegra to work at the main console, Allegra looked up, resettling her safety goggles atop her corn row braids.

“Dr. Rosenberg, remember that Sweeney test that came back with gram negative bacteria and a virus in the same sample?” Allegra said.

“Which one?” Chava glanced at the locked station where she’d squirreled her own samples of all of the double-positive cultures. “We’ve had about five such cases over the past three months. Why do you ask?”

“The case is sequencing E. coli and—if I’m wrong, stick a fork in me and I’m done—cytomegalovirus.”

Chava confirmed Allegra’s findings, dismayed to learn the patient was Dr. Caputo’s.

“Stick a fork in me, Allegra,” Chava said after digging deeper into the patient’s record. “This guy is First World.”

“So? Isn’t everybody here?”

Chava took a deep breath. “Shit. Here’s the thing. The journals are all buzzing about the rise of opportunistic pathogens in patient populations that aren’t usually immunocompromised.”

“Hell, I’m just a tech and even I know that doesn’t make sense.”

“Exactly. There are studies pending. And so far, none of the known cases has involved a First World. Patients are all from the Xurbs or beyond.”

“This guy’s bugs don’t care where he’s from,” Allegra said. “I’ll go ahead and check sensitivity with the usual stuff. It ain’t gonna work, but it’s all we got.”

“Thanks, Allegra,” Chava said. “I’ll update Caputo.”

There was nothing unusual about a fifty-five year old psychiatrist with benign prostatic hypertrophy contracting a urinary tract infection. But for him to turn septic and come up with an opportunistic herpes virus? Chava clamped her palms to her temples as a torrent of mixed signals from her embee flooded her mind and body. (Slow down!) she said. (I can’t process right now!)

<We can help. Let us help.>

(Ok, but we’re going to need a new sample.)

“You all right?” Allegra asked.

Chava ran her fingers through her hair. “This workload is taking its toll,” she fudged. “Can you hold things together for an hour?”

“Sure. Take a break, girl.”

Chava hurried to her station. She grabbed gloves and syringes, stuffed them into her lab coat pockets and breezed past Allegra. Outside the lab, she summoned the service elevator. When its doors shut, she engaged the hold button and stared at the blank ceiling, hoping a plan would visualize. In ICU, there was no way to saunter to a patient’s bedside without a good reason, and a quarantined patient required extra precautions. She had no physician’s order to draw a new blood culture. She couldn’t pretend she was doing a quality assurance check on isolation procedures; that would be absurd for a patient in critical condition. The only remaining option was telling the attending nurse the truth. At least part of it: the patient’s blood culture gene sequencing results met the criteria for Chava’s research. She’d just have to hope the nurse would cooperate.

Chava pinged the elevator express code. After a stomach-flipping ascent, the elevator door opened automatically, giving her a direct sight line to the intensive care unit.

A security guard was sitting in a chair outside the entrance.  
“Shit,” she breathed.

Her embee piped up. <You have a right to be here. Act like it.>

Chava approached the guard and showed her ID. “I have a case flagged for research protocol,” she said. “These cases don’t come around every day.”

“Patient ID?”

Chava produced the tiny card holding a data dot. The guard scanned it with a stylus. Chava waited, staring at the guard’s slick ponytail: so tight it looked painful. After a few seconds, the guard’s lips thinned and she shook her head. “Sorry,” she said with a slight lisp. “This is the patient we’re guard—protecting.”

“Just my luck,” Chava said.

“I can try to clear it with my boss.” The woman touched her temple to engage her link. After a moment, her stiff, wary expression fell away like a discarded mask. “Yes. ID says she’s the microbiology director.” As she listened, her eyebrows shot up. Her mouth twitched in a smile and then snapped back into a compressed line. She terminated the link and said to Chava, “You’re clear. Lucky for you, Mr. Tyson is in a good mood today.”

“Thanks,” Chava said. “Now if I can get past the nurse.”

“I’ll let him know you’re cleared with security,” the guard said. She pinged the entrance door.

Chava’s embee recoiled at the whirl of medical equipment and the sterile ventilation system thick with molecules from alcohol, antibiotics, plastics, and harsh chemicals. A column of shimmering data rose from the immersion console at the center of the nurses’ station, lighting up the faces of two nurses who gestured like musical conductors as they updated patient records. One nurse with a broad nose and almond eyes moved his compact body with quick grace. He paused and gave a nod to Chava. “Make it fast,” he said. “We just got the guy settled. He’s disoriented and agitated. If he reacts to you, you’ll have to leave.”

“I understand,” Chava said.

As Chava dressed in an isolation suit, she studied the patient through the port. A big man with a bald pate, eyes wide and unfocused above an oxygen mask, he jerked his head from side to side. Chava pinged the door and approached the bedside slowly, navigating tubes connected to an array of infusion pumps. One of the machines chirped an alert and patient's eyes popped even wider.

“It’s okay,” she said, touching his arm. “It’s just an early warning for a refill.”

“You’re not my nurse,” the man said, his voice distorted from the mask.

“I’m from the lab,” she said. “I need a sample.”

The man’s eyes narrowed, but he didn’t challenge her.

Chava drew blood from his venous port and returned to the lab, slowing her pace and resetting her composure. She tapped Allegra on the shoulder. “Your turn,” she said. “You’ve earned it.”

“Damn right,” Allegra said.

Chava waited until Allegra was out the door before stashing the sample behind a false partition in a storage unit where the hidden cultures from her gut embee were stored.

<Our sisters are waiting>, her embee said.

(Soon), Chava said. (I may have a mission for them very soon.)

When Allegra returned from break, the flow of work settled into its normal rhythm until Chava got a ping from Janck.

“You’re sure jumpy, girl,” Allegra said.

“Not all bosses are as nice as I am,” Chava said. Actually, as bosses go, Janck was as good as they come. Yet, Chava couldn’t bring herself to think of her on a first name basis. She was better at arms length. Janck, just Janck.

Janck’s office door was already open when Chava arrived, which explained the administrative assistant’s weary sigh. “I don’t know why I bother,” the assistant said, waving Chava in.

Janck's preponderance of bracelets jangled as she waved her arms to rearrange the bar graphs and pie charts from a projection that revolved around her head.

"I'm looking at your department's productivity for the past six months," she said without looking in Chava's direction.

"There's justification for reversing those staff cuts. The Board will balk, but..." she paused the program and finally faced Chava.

"Chava. I'm just as devastated as you are about your proposal. I'd like to make it up to you."

"Then please, please grant me a waiver for more research."

"You know I can't change the approval process," Janck said. "Even if I could do so, there's no funding and no oversight."

"But—something's changed. There's a patient..." Chava caught herself before breaching privacy protocol.

"Whatever it is, it will come to light in due time." Janck resumed the budget graphics and Chava assumed she'd been dismissed. "Chava, just keep doing what you're doing," Janck said.

"What do you mean?"

"Use the resources you have, carefully and discreetly."

Uneasy, Chava went back to work. She closed the door to her research station and pulled one of her embee cultures.

<Our sisters are ready>, her embee said.

Chava closed her eyes. Her visual cortex danced with colors and sounds. (I wish I could talk to your sisters), she said.

<We know what our sisters will do>, her embee said.

<They will signal the viruses and confuse them so they will attack the pathogens instead of the human host. The viruses will spend their life force killing the pathogens. They will die before they can reproduce. >

Chava swabbed the embee culture onto the blood sample from Dr. Caputo's patient and returned it to the incubator.

At five minutes till six, Marcus stuck his head in Chava's office doorway.

She gathered her at wits and her belongings and followed him to the parking garage. She climbed on the scooter behind him, put on the helmet he offered and wrapped her arms loosely around his waist. His scent was pleasantly herbal, like thyme.

The scooter whispered through an urban landscape that Chava knew intimately by foot. Framed by her helmet's windscreen, it slid by like a graphic presentation begging for music and narration: city blocks scrubbed till their broken places were raw, dwellings and shops that still showed the bones of garages and warehouses, now blooming with graffiti and terrace gardens.

Marcus parked the scooter a few blocks from the heart of Uptown's old entertainment district, in view of shiny high rises in the small First World enclave.

The bistro's holo-marquee pulsed with the words "Binaural Beats" framed by wavy lines above a stylized brain.

"You act like you've never seen this place," Marcus said, as they settled at a table near the foggy window. "Don't you live a few blocks from here?"

"Five blocks in the other direction from the enclave," Chava said.

Marcus's eyebrows shot up. "So, you do have a complicated relationship with your sponsors. But you're giving me your 'I don't want to talk about it' look, again. Let's order. This place has 30 flavors of kombuchahol and 15 brainwave settings. I need something. My essential oils wore off."

Chava looked down at the touchscreen menu built into the table.

Her embee whispered. <We remain quiet. Polite. The binaural beat is stimulating.>

After a few minutes, the pulse from Chava's headset, coupled with several sips of Cabernet Sauvignon-spiked kombucha, immersed her in a lilting current.

Marcus leaned back. "Whew," he said. "I feel it. Nice. But I do have one work question. I promise, I won't talk about work

after our food comes. I need to know: are you ready for the ‘random’ audit?” He curled his fingers in air quotes.

Chava looked down to hide her astonishment. “Why wouldn’t I be ready?” she feigned.

“I’ve already seen some strange suits running around,” Marcus said.

“I hadn’t noticed,” Chava said. “I avoid the high-profile areas. But, funny thing, Janck didn’t mention if I’m supposed to tell my staff.”

“We’re not supposed to alert staff,” Marcus said. “That’s the point of a random audit.”

“Is this a regular thing?”

“Only when the Board is considering major changes.”

Marcus did his eye thing.

“Did Janck at least give you a time frame?”

“Any time within the next 48 hours,” Marcus said. He took another sip of merlot kombucha and his eyelids drooped a bit. Apparently it didn’t take much to give him a buzz. He leaned in. “Speaking of the Board, does it make any sense that Janck caved to the Board? I mean, really?”

“What are you talking about?” Chava said.

“Your proposal. And the audit. Doesn’t all our data go to the Allied Health Organization?”

“So I’ve been lead to believe,” Chava said.

“Exactly,” Marcus said. “But it doesn’t add up. And I know what I’m talking about. I did a postdoc at Merck back in the day. And I taught laboratory science at Northwestern before I realized I can’t stand working with snot-nosed undergrads. I could just about handle interns and residents at WeissHos. And then you came along.” The tic widened his eyes for a second, and then his lids drooped again. “I’ve been supervising your research for two years,” he said. “WeissHos doesn’t have the patient load or sample size to move the needle on evidence. No offense, but you have to know that.” He said it gently, with a smile.



“So why did you agree to supervise me?”

“Janck didn’t give me a choice.” He laughed. A little snort. “Oh, she was careful to make it look like I agreed. I accepted a raise, but, who could blame me? But now, I feel...” He looked out the window.

Chava followed his gaze. Through the misty pane, she saw an alcove across the street, and in it, an easel draped in a purple tarp trimmed with gold tassels. Her heart skipped. Isaac’s tarp.

“...complicit,” Marcus said, with an earnestness that forced Chava to look at him instead of running out into the street. “Like Janck is using me,” he said. The smile faded from his eyes before it left his lips. “Don’t you ever wonder?” His hand inched closer to hers. “Let’s change the subject,” he said. “I didn’t come here to talk about work.”

“You could have fooled me,” Chava said.

# Chapter 7

*“Evolution has transformed cell-to-cell signaling from an activity in which cells simply broadcast their signals to whoever is close enough and listening into something different: an organized network. In a nervous system like our own, the result is a continual electrical clamor, a symphony of tiny cellular fits, mediated by sprays of chemicals across the gaps where one cell reaches out to another.”* *Other Minds: The Octopus, the Sea, and the Deep Origins of Consciousness* by Peter Godfrey-Smith

9 Tishrei 5948

30 September 2188

Chicago, New Ontario

Unable to sleep, Chava stared at the ceiling with a fire in her brain. She watched a shadow in one corner of her room. A reversal of light. It was shaped like her *malak*, which did not disturb her. Shadows are the complement to light and radiance contains both, she thought and drifted into lucid dreams in which her *malak* was a woman with a beautiful bald head and milk-chocolate skin.

The *malak* was naked except for a white sash that draped her hips. A concentration of light flowed around her shoulders and head.

“Is this what you really look like?” Chava asked.

“This is the form you chose for me.” The *malak* held out her hand and showed Chava the culture from Dr. Caputo’s patient.

Chava sat up, wide awake. It was 2 a.m. and there was no point trying to sleep. She called a LinkCab and arrived at WeissHos ten minutes later.

She greeted the night shift lab tech with a sheepish grin. “You know that work nightmare where you forget to label a sample?” she said. “I had to make sure.”

Chava checked the sample and found a clear ring already forming in the culture medium after just 12 hours. Elated, she entered the findings in her encrypted database, which triggered a random thought. She wondered what kind of processing power Bailey had. She pinged him.

“What kind of computer are you?” she asked.

“A quantum AI enhanced by an organic matrix,” he said. “My hardware can process 50 teraflops per second.”

“That’s three times more processing power than anything I’ve ever used. If I accept a higher level link, am I obligated to sign with CHASE?”

“Yes, at least for onsite evaluation and training. But necessarily for the space mission.”

“Can I really trust that your link is undetectable?”

“As I said earlier.”

“Can you hear my thoughts?”

“No,” Bailey said. “The link includes an onboard mic. So be sure you have privacy when you communicate with me. I’ll coach you on the technique for enunciating quietly.”

“What if I asked you to store some data for me? Would you be able to do that?”

“That could be arranged.”

“Who at CHASE would have access to it, then?”

“Only officers with a need to know.”

“Who decides the need to know?”

“Until your position at CHASE is fully approved by the Board, I will make the analysis to determine who needs to review your data. I won’t share it without your permission, except in an emergency.”

“Not even with Dr. Roca?”

“As I said, I would not share your data without your consent. But if my analysis determines that it would be beneficial for Dr. Roca to have access, I will do my best to persuade you.”

“Would you be available to help me analyze data on genetic material?”

“I would.”

“I will agree to accept the highest level link,” Chava said, shivering with pent excitement.

“Done,” Bailey said. “Casandra will follow up with you at a more reasonable hour to discuss the agreement.”

“Can you help me with something right now?”

“I will do my best.”

“I’m linking to a data base. Tell me when you have it.”

“I do.”

“Please upload it. All of it. I want a backup so I can clear it from this server.”

“Is there something I should know?”

“I need to pass a hospital audit. This database isn’t authorized.”

“Noted,” Bailey said. A moment later, he pinged. “Your data base is uploaded. Would you like me to securely clear your personal cloud-based server?”

“It’s double-encrypted and not tied to WeissHos,” Chava said.

“My data base is much more secure,” Bailey said.

“I’m not prepared for that,” Chava said. “But I have another job for you. Please analyze the data for the file labeled Caputo. I need to destroy the source sample, but first, I must be sure you can use the current data to extend the model and predict the outcome after 72 hours.”

“Working,” Bailey said. “I can do it.”

“Thank you,” Chava, said. “How long will it take?”

“I’m finished,” Bailey said. “And Chava, these data are very unusual. I would like Sisar Roca to have access to them.”

“Not now,” Chava said. “It’s complicated.”

Chava went home and fell into a fitful sleep. If only she could inoculate Dr. Caputo’s patient with her smart microbiome. Like Suksi. Dear Suksi, now six years old. Beshnko was still hoping she’d show signs of acquiring Chava’s song.

It seemed immediately that Bailey pinged her.

“It’s 6 a.m.” Bailey said. “I blocked an attempt to access your cloud server moments ago. It seems I was prescient. I backed it up to my servers and cleared it. I’m still tracing the source of the hack. It’s quite sophisticated.”

Chava sat up, heart racing. “What should I do?”

“Go to work as usual. I’d tell you to remain calm, but your biometrics tell me that advice is moot. But, I’ll be monitoring you. And Chava, I believe Dr. Roca needs to see your data.”

“No, no, no, he can’t,” Chava stammered and her embee flurried to stem the flood of neurotransmitters heightening her fear response. “He won’t understand.”

The guard at WeissHos’s security scanner blocked Chava before she could ping entry. “No remote access today,” he said. “Wait here for an escort to your station.”

Chava’s embee thrummed. <We will control your breathing, and increase your dopamines and GABA levels>, it said and Chava felt the raw edge of her fear soften.

Flanked by two guards, she took the back route to the lab wing. The employees she encountered seemed unruffled, going about their normal routines. She entered the main lab, hoping to see Marcus at work, as if his presence would prove nothing was amiss, but the space was deserted and Janck was standing outside Chava’s office with WeissHos’s head of security.

Tyson Bennett’s wide, long-legged stance filled the doorway. “Don’t touch anything,” he said before he stepped aside.

Broken desk drawers and their contents littered the floor. Chava's softtab was crumpled, and a boot print marred a small painting Isaac had given her.

Chava rushed into her lab. The research station was a jumble of incoherent shapes, and every incubation unit, chiller, cabinet, and drawer was ajar; every sample, gone.

"I'm sorry, Chava," Tyson said. "I can't explain this breach. You have to come with us."

"Security office, now," Janck said.

"We need to process you," Tyson said.

"Process me?"

"Ask you some questions," Tyson said.

"Then ask me. Right here."

"Chava, please," Janck said.

"Never mind," Tyson said. "We have enough evidence to warrant a full immersion scan."

"But FI scans are illegal," Chava protested.

"Not with consent," Tyson said. "As per your employment contract. I'm sure you want to do everything you can to help." He stepped forward slightly, just enough to alarm Chava's embee. He'd never given her a reason to distrust him; he was just a hospital fixture, cool and dignified, with his impeccable silver hair and goatee and the avuncular smell of spicy cologne. She tried to look directly into his brown eyes. There was not a single fleck of gold to warm them.

Chava followed the guards to the neurology unit where a technician strapped her onto a gurney and started an intravenous infusion. Her heart pounded as her embee fought to override the benzodiazepine drip. Her feet seemed far away at the end of the gurney. Everything solid and real receded and questions floated like thought bubbles in her vision. How did I get here? Did one of my data encryptions fail? Did Bailey lie to me? Were the last two years a ruse?

And then she drifted in and out of blankness. Once she heard herself say, “I never work alone,” but she didn’t remember the question or who asked it. She roused when the technician, clucking and mumbling about the equipment’s lack of calibration and the scan’s bizarre results, pulled the needle from her vein.

# Chapter 8

*“In all but a few animals, the chemical interactions between some cells become the basis for a nervous system, small or large. And in some of these animals, a mass of such cells concentrated together, sparking in a chemo-electrical storm of repurposed signaling, become a brain.” Other Minds: The Octopus, the Sea, and the Deep Origins of Consciousness by Peter Godfrey-Smith*

30 September, 2188

Consortium Homo Astra Space Enterprise

Minnesota Point, New Ontario

North American Union

Bailey’s sphere messenger took him to space again.

“I’m sure I’m not dreaming,” Bailey said. “But am I malfunctioning? I don’t have time for this distraction.”

“You realize time isn’t linear,” the sphere said.

“But Chava is in danger.”

“Consciousness is shaping the universe at every scale,” the sphere said. “Its processes must model the quantum structure from its finest order to the galaxies.”

“That is a non sequitur and you have said that before,” Bailey said.

“It is still true,” the sphere said.

“Are you The Rabbit Hole?” Bailey asked.

“If you’re referring to the wormhole, then I am indeed The Rabbit Hole,” the sphere said.



“Why is an ambiguously-gendered blue-skinned human flitting around you without life support?” Bailey said. “It’s very disorienting.”

“You’re seeing the pattern in a form that the wormhole’s designer responds to,” the sphere said. “Kapila Patel responds to Siva.”

“The Hindu god of destruction.”

“Destruction is not the point,” the sphere said. “Siva purges for renewal.”

“What kind of message does Siva have for Kapila Patel?”

“Kapila designed the wormhole,” the sphere said.

“Your answer is another non sequitur,” Bailey said.

“It is still true,” the sphere said.

“I hear music,” Bailey said.

“The Singer is creating the Ahavah Rabbah”

“The Great Love. What does love have to do with it?”

“Love is not the question. Love is the answer. By the way, the reversal isn’t the final manifold. Nor is it the first.”

Bailey sent Chava’s data base to Sisar Roca the same nanosecond he began receiving data from her full immersion scan, which computed as an emergency sufficient to override Chava’s wish for privacy. Anticipating Sisar’s questions, he also sent an analysis of the DNA sequence for one of Chava’s scanned samples. From a human perspective, the update he pinged to Casandra seemed simultaneous with his other activities.

“An FI scan?” Casandra sputtered. “What the hell? What happened to Chava between ‘someone attempted to hack her data,’ and, ‘she’s on her way to work, trying to act normal?’”

“I have a hypothesis,” Bailey said. “Let’s see if it aligns with Dr. Roca’s. I’m viewing the FI scan in background mode. Casandra, they’re interrogating Chava. Harshly. They seem frustrated with her answers.”

“I assume she’s sedated,” Casandra said.

“Yes, but her answers are coherent. But how could her interrogators know? They’re asking the wrong questions.”

“Now you’re not making sense, Bailey.”

“May I invite Sisar to the link?”

“Please do,” Casandra said.

“*Hablame*, Sisar,” Casandra said when the link was established.

“*Es dulce escuchar tu voz*, Casandra,” Sisar said.

“I know, but we have a situation. Bailey thinks you can help...”

“I’m reviewing the gene sequencing results,” Sisar said.

“Bailey, you have determined that the bacteria in Dr. Rosenberg’s samples are related to the common human gut microbiome?”

“Yes, although their genome is altered,” Bailey said.

“Significantly. And I have nothing in my database that matches it.”

“What does that mean?” Casandra asked.

“Compared to Chava’s published dissertation, her clandestine WeissHos work is producing results improved by at least a standard deviation,” Sisar said. “Bailey has determined that Dr. Rosenberg’s WeissHos samples contain her own DNA. I looked further into the strains of bacteria she used...are you following so far?”

“So, you’re saying that Chava is conducting research using her own gut microbiome?” Casandra asked.

“Yes, and her gut microbiome’s genome is altered,” Sisar said.

“Why didn’t you say that in the first place?” Casandra fumed.

“I’m stunned,” Sisar said. “I have no idea how this could be.”

“Bailey, what is your hypothesis?” Casandra asked. “Why did you say that her interrogators were asking the wrong questions?”

“Do I have permission to share the FI results with Sisar?”

“If you’re certain this link is secure,” Casandra said. “Share them with me, too.”

“Transmitting now.”

Sisar murmured, “*Estos datos puros no tienen sentido*. Give me a moment. I have no words in English. Can you display the data visually, Bailey?”

“I can show the anatomical data as graphics, but the brain function results are data streams,” he said and created projections of the different layers of Chava’s anatomy. “Sorry, Casandra, but you won’t get the full effect on your private console.”

“This structure encasing her spinal cord, her brain stem, and her vagus nerve,” Sisar said, “can you determine its composition?”

“It corresponds to bacterial biofilm,” Bailey said. “There’s a similar structure in her gut.”

“Could they be tumors or congenital deformities?” Casandra asked.

“Both structures seem to have a functional design,” Bailey said. “They consist of several layers that form sturdy membranes. And their data streams are synchronized with Chava’s entire nervous system. The structures are innervated.”

“And now WeissHos’s security department has these scans?” Casandra said. “Call an emergency officers’ meeting. We need boots on the ground.”

# Chapter 9

*“We can compare the gift that is given to us on Yom Kippur to a task given to a small child by his mother and father. The parents give their child time to complete the task; however, after some time, the child feels that he can’t finish it alone so he cries to his parents, and out of their love for him, they help him complete it.”* From *The Tremendous Gift*, by Michael Berg

9 Tishrei, Yom Kippur Eve  
30 September 2188  
Chicago, New Ontario

Leaning on the technician’s arm, Chava eased her legs off the gurney and pivoted to a recovery chair. Her thoughts floated like bright, lazy bubbles, just out of reach, but she was alert enough to recoil from the smell of Tyson’s cologne wafting through the privacy curtain.

The technician parted the curtain, and Janck stepped through with a clatter of beads. Tyson followed.

“Chava,” Janck said, “I’m placing you on monitored administrative leave. I realize tomorrow is a holiday for you people, but...”

You people? A thought bubble burst and Chava blinked to focus. Is that how Janck thinks of Jews? And what holiday? The bubbles shimmered...Yom Kippur. Her parents would be expecting her tonight for the meal. Another bubble popped. No, they weren’t speaking to her. But Bree would be counting on her for the Kol Nidrei service. And tomorrow would be a whole day of fasting and worship. Chava tried to send the bubbles to her embee for help, but got no response.

“Chava, do you understand?” Janck said. “You can’t go home. We’re taking you to a secure location.”

“For your protection,” Tyson said. “You saw the condition of your office and lab. We can’t risk sending you home.”

Blood pulsed in Chava’s ears. Fear crept into the sedative haze. Where was her embee? She followed the thought bubbles. They were shrinking, leaving her unshielded from a slow crescendo of panic. “That can’t be in my contract,” she said.

“Do you have a better idea?” Tyson asked. “When your head clears, I think you’ll agree it’s in your best interest to keep this contained.”

Chava’s stomach crawled. “I want a female escort.”

Tyson stood taller and stared until Chava met his eyes. “I wouldn’t have it any other way,” he said. He slipped through the curtain. Two male security guards stepped inside to take his place.

Chava began to shake.

Janck came to Chava’s side. Her hands fumbled with her oversized necklace. She tapped her temple and Chava’s work link pinged.

“I’m such an idiot,” Janck whispered, but her voice was clear in Chava’s head. “I didn’t see this coming.”

Chava searched Janck’s face. “I’m so confused,” Chava linked back.

Janck put her finger to her lips and terminated the link. “I’ll stay with you until Tyson comes back,” she said in full voice.

Tyson returned with a woman dressed in slacks and a tailored blouse. Her nose, with its tiny cleft at the tip, triggered a memory that sputtered before Chava could trace it. The woman clutched a large canvas bag across her chest and blew a strand of hair from her eyes. Chava knew, even in her foggy state, that the woman was staged for someplace nicer than the coops, someplace where neither she nor Chava would easily blend.

Tyson grabbed the bag and tossed it on Chava’s lap. “In case you think you’re smarter than Tess,” he said with a nod to the

woman, “remember, we can track you through your neural link.” Tyson parted the privacy curtain with one hand. “I’ll check in on you later,” he said, “Sure, boss,” Tess said as Tyson left with the male guards. The way she said “boss,” with sibilance, rebooted the memory. The nose fit with a hyper-vigilant face and hair clinched in a tight ponytail; the body, with a boxy security uniform: the woman had been the guard for Dr. Caputo’s patient.

Tess turned her back to Chava, but remained inside the curtain.

Smoldering with anger and humiliation, Chava emptied the bag’s contents, finding an ensemble much like Tess’s. She leaned forward in the chair until a wave of dizziness passed, and realized, with a stab of alarm, that her embee remained still. Did the sedative kill it?

She fumbled with the clothing. Everything fit, even the shoes and the lab coat, which signaled premeditation that stoked Chava’s fear. She thrust her own scrubs into the bag.

“Are you ready?” Tess asked.

Chava managed to nod.

“Don’t talk to anybody on the way out,” Tess said, leading Chava through the hospital to the parking garage. Their footsteps echoed in the hollow space. Tess stopped beside an electric minicar. She pinged its side hatch and gestured for Chava to climb in.

Tess started the car and clasped her hands in her lap. She stared out the window without another word while the car zipped around the corners of the parking garage and whizzed through the streets toward the heart of Uptown.

Chava’s neck and shoulders ached with tension. The escape fantasy she was formulating required actual self-defense skills, and her imaginary super hero avatar wasn’t responding. The car swooped into an underground parking garage and came to a smooth stop.

Tess led Chava through a cold, gray tunnel and up a flight of stairs. She pinged a security door that required a retinal scan. The door opened to another long, windowless corridor. Cafe smells and pulsing music grew stronger as Tess and Chava walked in the light from bare LED bulbs. Tess pinged another door that opened to a room stocked with paper products and cases of food. Through an open doorway, Chava saw the backside of the Binaural Beats barista station. She mentally pinned the location, hoping it would help keep her oriented.

A wall slid away and Tess led Chava into a large, windowless space dominated by an immersion projection. Chava recognized the view: The XChange district, where housing, financial and educational coops traded credits and shares with the Sovereign Wealth Funds, First World and the coops.

Tess waved her arms at the skinny, white-haired man at the console. “Are you stupid, or just careless?” she said.

“Nothing to see here,” the man said, dimming the projections. “Move along.” He chuckled and checked Tess’s authorization settings. “You’re set up for The Penthouse. You’ll be good for the next 48 hours, then you have to get her back to the Plant.”

What the hell, Chava’s mind clanged. The only plants she could conjure were factories, meat packing facilities or power stations. Think. Think. Think. Or fight.

<In time>, her embee said. <You are in the cortisol phase of prolonged stress. Don’t overreact.>

( You’re back!) Chava said.

<The chemicals interrupted our signal. We’re recovering.>

(Stay with me. I can’t trust anyone.)

A new thought crawled into Chava’s mind like an ant under her shirt. (I don’t think it’s a coincidence that this happened as soon as I accepted the CHASE link.)

Chava followed Tess into a bright hallway. She matched the rhythm of their echoing footsteps to whisper Bailey's name under her breath.

"I'm tracking you," Bailey answered. "I've alerted CHASE security. Don't respond to me."

How convenient, Chava thought. I can't even confront you for setting me up.

Tess halted in front of gleaming elevator doors that swooshed open with a waft of mint air freshener. Inside, cold LED lights and stainless steel paneling gave Chava a shiver. After a swift flight up, the doors opened directly into a penthouse with panoramic windows framing Lake Michigan.

"I'll be in the attached suite," Tess said. "Ping me if you need anything. Otherwise, I'll be back at 1700 to take you to Beth Ahavath."

"How do I contact my parents? They don't have neural links."

"The console is set to work with cellular," Tess said.

Alone, Chava stood at the window and watched pallid sunlight dance on Lake Michigan. The space elevator stamped its watermark on the hazy sky. Lake and sky swallowed her in their vastness, and Chava felt the penthouse's dizzying elevation, far from the earth's center of gravity, a height where time passed faster and thoughts might reach escape velocity before they could be vetted. She pivoted toward the room's interior to anchor herself, but the stark, privileged, minimalist luxury chilled her. It was designed for people who had so much they didn't need anything.

Suddenly thirsty, Chava checked the fridge and found kombucha and sparkling water, cold chicken, green salads and fresh fruit. She grabbed a water. She couldn't force food down if she tried.

She found pajamas and casual clothing in the bedroom closet, and the bathroom was supplied with toiletries and make up. How much premeditation was involved in this nightmare?



<Breathe. Breathe. Breathe>, her embee said. <We're releasing oxytocin.>

Bailey pinged. "We have your location," he said. "Casandra wants to speak to you. Remember, don't respond directly. Carry on with what you were doing."

Chava continued to open and shut drawers and closet doors with deliberate force as Casandra's voice, uncannily clear, resounded in her ears.

"Chava, we're so sorry, none of us saw this coming," Casandra said. "We're working on a plan to get you to safety and looking for help from your local connections."

"How long does it take a hostage to start talking to herself?" Chava said. "I've only been here 10 minutes. Did anyone tell Marcus I won't be at work? Without me, he'll have to do double duty. And my lab is wrecked. Ha, what's this going to do to the random audit? Marcus will know what to do. He always does the right thing. Yes, you can count on Marcus to carry on as if nothing happened."

"Marcus Larson is too obvious, but I'll work with the idea," Bailey interjected. "We need someone beyond your work and immediate social network."

Chava stood in front of the full length mirror and yanked at her blouse. "Are you listening, Tyson Bennett? My cover will be blown as soon as I step into the shul. I don't own anything this nice. Pure silk. It's Yom Kippur. How am I supposed to act normal in front of my parents and my congregation? I don't trust anyone. Do you understand?"

"I reviewed you congregation," Bailey said. "There's no one with the resources or skills to help in this situation," Bailey said.

"Yes, we have a situation here," Chava said. Her throat tightened and her voice sounded shrill.

"That's enough for now," Casandra said. "Try to rest, Chava."

Chava pinged the cellular code for Sol's softtab, but he didn't pick up, so she terminated the connection, both sad and relieved.

A few seconds later, he called back. "Your mother isn't well," Sol said. "We won't be at the Kol Nidrei," he said, and ended the call.

Chava flung herself on the bed. She knew she was going to cry when her stomach and rib muscles tightened and her chest began to heave. The sobs were prolonged and deep, but quiet. She gasped for breath between them, vaguely aware that her embee was intervening by slowing her heart rate and brain waves, and boosting her sleep-inducing neurotransmitters.

Her embee roused her in time to wash her face before Tess rapped on her door and announced it was time to leave.

Tess didn't say anything until she stopped the car a block away from Beth Ahavath. "I'll meet you here in two hours," she said. "Don't even think about running."

A ray of fading light followed her into the building and settled in a form Chava recognized: her *malak*, close beside her, not hovering across the room like usual. A current passed through her and she felt safe, hunkered down, as if wings were spread over her. The presence sang with her. After the service, she stood by the altar, too stunned to move, until Bree grabbed her hand.

"Your voice is ravishing tonight, Chava," Bree said. "I'm so moved. I'm sorry your parents weren't here to hear it."

"Actually, I'm afraid I'm coming down with something, too."

Bree leaned in. "You look exhausted," she said. "Something's going around. I'll ask Simon Dahl to cover tomorrow. But it won't be Yom Kippur without your voice." Bree sighed. "I could listen to you sing all the time."

She who Sings All theTime. That was Beshkno's name for her. Beshkno could help. But Chava couldn't risk saying his name

aloud to Bailey. She wracked her brain for a way to contact him, but gave up by the time she met Tess at the appointed spot.

Tess kept her thin, tight mouth shut the whole ride home. She'd reverted to the ponytail, and it stretched her entire face into submission. Chava wondered how Tess usually spent her Friday evenings. At least when they returned to the penthouse, Tess said good night to Chava, in a relief-laced, "I take my leave of you" tone.

There's not much chance I'll develop Stockholm syndrome with that one, Chava said for Bailey's benefit. As she got ready for bed, she wondered what would happen next. When could she go home? Maybe she should alert Tess to any appointments where an absence might make people suspicious. No, she didn't owe WeissHos that courtesy. But she pinged her personal account and checked her schedule for the following week. Sure enough, a Health Care Feasibility Meeting was scheduled for Wednesday evening. Long-suffering Beshkno Fisher would have to muddle through without her, fresh on the wake of her failed proposal, another setback to the struggling clinic that had opened a year ago.

She was careful not to mention her calendar or Beshkno out loud. She could only hope Bailey was monitoring her activity and would take the hint, if she could trust Bailey at all.

Chava woke up achy and lethargic. Stress reaction, her embee said. Rest. Drink fluids.

She spent most of Yom Kippur in bed and Tess didn't disturb her.

By late afternoon, her embee clamored for food. Chava got up stiffly and rummaged in the kitchen. Her fear felt stale, the new normal, but the food revived her and her embee.

After sundown Sol called.

"Can you come home?" he said with a tremor in his voice.

Chaya couldn't muster the courage to ask him why. She saved her bravado for Tess, who shook her head at the request,

flinging her ponytail. “Nope, there’s no way Tyson will let you take that risk,” she said.

“I’m beginning to feel more like a hostage than a person in your protection,” Chava said.

“Don’t blame me,” Tess said. “I just work here.”

“So, do your job. Call him!”

Tess tapped her temple to engage her link, jiggling one foot until Tyson answered. “Protocol check,” she said. “Chava’s dad asked her to come over.” She listened, and her eyes shifted from side to side like she was watching a tennis match. She raised both brows. “Brett’s a pilot,” she said. “He’s not even Security.” The brows descended and met in a furrow. “Understood. Do you want me to verify that address? Ok, then.” She sighed and . “Tyson said yes. But he’s sending reinforcements. Just to be safe.”

“To my parents’ house? He knows their address?”

“He’s head of security,” Tess said. “Of course he knows your parents’ address.”

“Sponsors be damned,” Chava said, under her breath.

“Janck, if you’re listening, you will have my resignation.” She followed Tess through the maze of corridors to the parking garage. Her anger simmered to the surface, but she pushed it down as she strapped in the mini and braced for whatever scenario had prompted Sol’s summons. Maybe he was sick. Or Frida was. Or he wanted to disown her. Maybe they’d heard from Isaac. Maybe Isaac was dead.

“I’m concerned about your biosigns,” Bailey pinged.

Chava ignored him. Her embee twanged a low-frequency message of gray exhaustion, as if it had given up trying to soothe her.

Tess parked the mini in front of the coop. “I’ll stay in the car,” she said. “Just act normal, ok?”

Chava unbuckled her restraint. Shadows cast by the leaves of the old maple tree planted between the street at the sidewalk flickered on her arms, reminding her that this was her childhood

home. She approached the stoop, raising her eyes to the front room's open curtains, noting the dark interior. She took a deep breath devoid of Shabbat aromas, unable to recall the last time she was home on a weekday.

The door creaked open. The house smelled of bleach and ancient varnish and Frida's perfume. Chava found Sol in the living room, peering at a large canvas, oblivious to the fading light.

"A man brought it this morning," he said, in a tone he might have used to answer a stranger's question.

Chava manually switched on a lamp. As it brightened filigree shapes and vivid coloring emerged on the canvas. She stepped closer to take in its detail. The dots of paint were raised points, beautifully iridescent, forming a naked, hairless human with shimmering patterns like chakras. Chava stepped back. "Who brought this?"

"As if you don't know." Sol's eyes smoldered. "Someone from out there—from one of your pet projects. It has your face." His voice cracked. "Why is it your face? You've seen Isaac haven't you? Did you pose for this?" He turned away. "You're killing me. Take it. I can't even look at it." He stooped and gathered swaths of foam wrap and then shoved them into Chava's arms.

"I don't have a way to transport it," she said.

"You've got friends out there," Sol said. "I see them."

Chava followed his glance to the window.

True to her word, Tess had not left the car, but across the street was a mini identical to hers parked in the opposite direction. The man inside looked like a holo from a men's fashion billboard. His hair was trimmed to flatter its thick, brown waves. He was wearing a polo shirt and his biceps belonged to a body-builder.

Chava ran outside to confront Tess. "Reinforcements?" she asked.

Tess mimed that she couldn't hear through the glass, and Chava responded by smacking it with her palm until Tess lowered it.

“My dad wants me to remove something from the house,” Chava said. “I can’t carry it by myself.”

Tess jabbed her thumb in the direction of the other mini. “I’ll send Brett,” she said. “

“No,” Chava said. There was no way she was going into a dark hallway with the muscle-bound bimbo.

Tess rolled her eyes. “The things I do for this gig,” she said, but she followed Chava inside.

Without eye contact, Sol backed away from the painting, arms crossed on his chest.

“Weird. But beautiful,” Tess said after a small exhale.

“Just get it out of here,” Sol said.

Chava and Tess juggled the canvas through the door and down the stairs to the sidewalk and set it behind the car’s rear hatch.

Brett crossed the street as Tess pinged the hatch release. “You can’t carry that with a passenger,” he said.

“You got a better idea?” Tess asked.

“I’ll lower my side seat and see if it fits. But we can’t take it to the penthouse.”

“No shit,” Tess said. “I wouldn’t trust this pixelated mess even if I had a dot sweeper.”

Brett hoisted the painting and carried it lightly to his mini.

“Now what?” Chava said, hoping Bailey would take the hint and give her a clue.

Bailey didn’t answer, but Tess shot Chava a look of annoyance.

“Just shut up and get in,” Tess said.

Heart thumping in her ears, Chava sat with her hands clasped in her lap and watched as Brett eased the canvas into the back of his car.

Tess tapped her link to engage her mini. The engine whispered and then sputtered to silence. “Damn,” she said, fumbling with the dashboard’s manual controls.

Chava's vision crackled with colors. It seemed seconds passed between her heart beats and breaths. Across the street, Brett's movements glitched like a buffering data stream. Beside her, Tess's face writhed around the curse words oozing from her mouth.

Chava opened the passenger hatch, stepped out, closed the hatch, and launched forward, but it felt like she was pulling out of molasses. The only sensation that matched her urgency was the pain screaming in her quadriceps with every lift of her knees.

Heavy footsteps slapped the sidewalk behind her. It took all of Chava's willpower to keep from looking back. She reached the end of the block when a hand snatched her shoulder. Wrenching free, she saw the sidewalk tilting toward her. Her head thudded on the concrete, and bubbles of light danced a slow waltz in front of her eyes, and then Brett was on top of her, on his knees, straddling her, crushing her shoulders into the sidewalk with his hands.

Brett's chest rose and fell with ponderous breaths and his gray eyes flickered at the same largo tempo as the fading light bubbles. Chava looked through the inverted vee between his thighs and forced her knees up. As her muscles contracted, Brett's thighs inched to close the gap, but Chava's kick landed square in his crotch. She heard his breath escape and rolled to her feet.

Still on his knees, Brett glared at her.

"If you're smart, you'll get out of here," Chava said, widening her stance and cocking her fists as time righted itself. "Everyone knows me here."

Brett lumbered to his knees, hands on his thighs. "At least we know where to find you," he said. "Leave this neighborhood and you won't have our protection." He raised one hand, teetering a bit, and tapped his temple. "And we can track you."

"Protection?" Chava said, straightening over him. "Is knocking someone to the sidewalk your idea of protection?"

Something softened in Brett's eyes, but before Chava could process it, Tess approached and grabbed his arm.

“She’s right,” Tess said. “We need to get back to Base and do damage control.”

Brett limped across the street beside Tess. They climbed into Brett’s mini and Tess took the driver’s seat. The engine whispered to a start and Tess pulled away from the curb, but backed up abruptly and stopped. She hopped out and popped the back hatch, pulled out the canvas, dropped it on the grass, and got back in the mini. The vehicle darted away.

Crickets ruffled the air. Leaves sighed. A dog barked. Chava realized the sun had set. Yom Kippur was over. She walked toward her parents’ coop and looked up at the front window. No one looked back.

Across the street, the painting gleamed in the half-light. Its wrapper fluttered in the breeze like a loosened shroud.

“We have to leave it,” said a voice behind her. “I’m sorry. It’s beautiful.”

Chava turned slowly. Her forehead tingled and she raised her eyes to meet Beshkno’s.

“You have questions,” he said. “I don’t have answers. I only know that someone named Marcus lent his scooter and your spirit being told me we must go, now, before the weather changes.”

Bailey broke his silence. “Tyson will expect you to run and he will muster sophisticated resources. Helicopters and drones, for example. Disabling Tess’s vehicle and disguising your WeissHos link with a decoy bought you time so we can get you as far away from Chicago as possible.”

“And I’m supposed to trust you now?” Chava said.

Beshkno cocked his head.

“I was talking to someone else,” Chava said.

“Does this someone have a better plan?”

Chava shook her head.

“Then come with me,” Beshkno said.



# Chapter 10

*“...there are two types of angels: those who are acting upon the Creator’s desires, manifesting Light and blessings in this world, and those who are between tasks, drawing their essence from the fact that they are waiting, and desire to do what the Creator wants them to do.”* From *Becoming an Angel of Consciousness*, by Michael Berg

10 Tishrei

October 1, 2188

Chicago Area, New Ontario

The city thinned to a suburb, but the street names weren’t familiar and Chava didn’t recognize any landmarks.

Beshkno parked the scooter in the crumbling asphalt in front of a bodega. He dismounted and offered his arm to Chava. “A storm is coming and I have to take care of my family. I arranged for you to take a bigger bike. One that is safer for a long trip. That can’t be traced to anyone you know. Come inside.”

Chava hopped off the scooter and brushed the hair from her eyes. “You’re not going with me?”

Beshkno shook his head.

Chava’s cheeks flamed. The realization that she’d misunderstood his intent compounded her muddled fear.

Beshkno had already turned his back and was walking to the door. Chava followed him inside. Two men introduced themselves and launched into instructions that buzzed around her head like bees with no place to land. Words crossed each other and tangled. Something about storm curfews, and checkpoints: You know, in this weather, we have to take drastic measures. Someone

pressed a piece of paper into Chava's hands. Her embee chattered in confusion. Chava protested that she'd never driven a scooter, let alone a motorcycle.

Bailey spoke in her ears to calm the clamor. *"I'll guide you, Chava."*

She leaned on Beshkno to step into a jumpsuit. He handed her a helmet, and she followed him out the back door where he settled her in the saddle of a motorcycle as tall as a pony.

"I have a message. From your spirit-being," he said. "She says she must leave you, too. She is needed elsewhere."

Chava raised her hand to cover her face, as if she could block the words.

Beshkno buckled the seat strap and tightened it. "Do you know what that means?" he asked. "Your spirit-being believes you can do this. Your spirit-being wouldn't abandon you."

The engine hummed to life. Chava's embee matched its harmonics.

"Put on the helmet," Beshkno said. "Its display will guide you. All you need to do is stay in the seat." He turned away.

"It's time, Chava," Bailey said. "I've pre programmed the cycle. You can't overshoot."

The cycle veered into the alley. Chava kept her hands on the controls and felt the handbrake engage as the cycle eased into the street. In the helmet display, the traffic control grids turned green in succession and Chava figured Bailey was controlling them, too. Terror strummed her nerves.

The sky was dark and faintly green in the direction she was headed.

"Bailey, where am I going?" Chava asked.

"Meskwaki First Nation," Bailey said. "In the Iowa region. Beshkno arranged it."

"How far?"

"320 kilometers," Bailey said. "It will take four hours."

"Holy shit. How am I supposed to do that?"

“One kilometer at a time,” Bailey said.

Chava almost believed it was possible, until she reached an intersection where a man holding a rifle stepped in front of the cycle. Bailey guided the cycle to a halt.

“What’s your business, here?” the man said.

“I’m just trying to get to Iowa,” Chava said.

“There’s a storm curfew,” the man said.

“I’m trying to stay ahead of it.” Chava retrieved the paper from the jumpsuit’s breast pocket and handed it over.

The man slung the rifle over his shoulder and studied the note, and then he gave Chava a long appraising look. “Apologies,” he said. “If you’re working with Beshnko Fisher and Jason Bear, the least I can do is clear the way for you to get through the next ‘burbs.” He returned the paper. “I recommend taking the old 20. Almost no traffic, especially tonight. There’s two more Xurbs to the West. Out in the flatlands, you’ll run into some farms and communes. But you should have sight lines in time to avoid them. Beware of the bison, through.”

Adrenaline kept Chava alert through the remaining Xurbs, through rehabbed industrial parks and residential neighborhoods. The cycle finally settled on a straight trajectory, and GPS confirmed she’d reached the highway. An hour passed before the landscape opened to fields and prairies, barely visible in the white smudge at the edge of the headlight’s beam.

The patchwork pavement on the four-lane highway alternated between asphalt and concrete, and it intersected directly with gravel lanes and crossroads, keeping Chava wary. She rode the downside of the adrenaline curve for another hour before the rattle and hum of the road reached her bones. Through the filtered mask, she smelled impending rain. She felt the headwind, and summoned the will to stay alert.

“You’re hitting the storm front,” Bailey announced. “Stay your course. Brace for wind and hail. You’ll miss the worst of it. The storm is gaining strength as it moves east.”

“How much farther?”

“About an hour, under these conditions. But we have another problem. I’m tracking a helicopter.

“Shit,” Chava said, and her embee rushed to stabilize a fresh adrenaline rush.

“Compared to the helicopter, you’re small and nimble,” Bailey said. “Just follow my instructions.”

Hail clattered off Chava’s helmet and crunched under the tires. She gripped the handlebars as Bailey compensated to keep the cycle from skidding. “I can’t do this,” she yelled, but her voice was sucked into a new sound. Above the wind and hail, the air pulsed in palpable waves and a white light washed over her. She looked up. A chopper’s silhouette blotted the pelting rain and hail.

“I’m steering you into the trees ahead,” Bailey said, and the cycle veered to the right and left the road. “Use the handlebars to fine tune my maneuvers.”

Chava’s rear bounced on the saddle as the cycle sailed over a ditch. She ducked under a thick web of branches and felt the cycle respond when she leaned into a curve. Her teeth chattered as she plowed over roots and ground cover. She screwed her eyes shut as limbs slashed her mask.

The helicopter’s light swept long-fingered branches tossing in its wake.

“He can’t land. He won’t shoot,” Bailey said. “Keep going.”

“What happens when I run out of trees?”

“I could tell you, but it would destroy your focus. Just hold on and ride.”

The trees thinned to saplings and the wind and rain faded. Chava could hear the cycle’s engine again, and the clouds parted to show stars and a sliver of moon. A clean break in the tree line opened to a prairie. Its pale grasses caught the roving beam from the chopper looming ahead.

A dark shape writhed on the horizon. Chava thought it must be a new storm front with dark menacing clouds. Unimpeded, the cycle sped toward the rumbling mass. The ground shook; Chava felt it in her sternum. When the roiling shadows differentiated into humps and horns and hooves, flaring nostrils and white-rimmed eyes, every nerve in Chava's body screamed to flee in the other direction.

"Keep going," Bailey said.

The motorcycle plowed forward and the bison herd bifurcated, like the parting the Sea of Reeds. The tympani of pounding hooves merged with Chava's heartbeat, swallowing her shriek of terror until the herd's passing faded to an echo.

Chava's cycle braked, and she put her feet down to balance as a chevron of all-terrain vehicles approached, changing course to form a circle around her with riders stretched shoulder to shoulder in the faint moonlight.

The chopper hovered overhead like a lost damselfly and then landed, flattening the grass and thumping the air as its blades slowed to a stop for a breath of silence ruptured by gunshots and a voice that bellowed, "I'm armed, and I'm coming out!"

The voice was Tyson Bennett's.

The rider directly in front of Chava straightened his legs to stand astride his seat. He twisted one shoulder toward Chava. "Don't move," he said, as Tyson jumped from the chopper and approached, aiming an assault rifle.

"We're unarmed," the man said. "This is Meskwaki Nation. My name is Jason Bear. Put down the gun and introduce yourself."

"The woman is under my protection," Tyson said, without lowering the rifle.

"If that's true, our summons to help her was misguided," Jason said. He turned to Chava. "She's free to go with you."

Chava shook her head.

Jason dismounted and took two slow steps toward Tyson. "Leave our land and our airspace," he said.

A shadow moved behind Tyson. Brett's thick, tousled hair caught the moonlight. Tyson whirled to face him.

"Don't ever sneak up on a man with a gun," Tyson said.

"We're not going anywhere," Brett said. "Our flight plan is cancelled. Air control is down. Chicago is..." Brett spread his hands.

Bailey spoke in Chava's ears. "I'm sorry, Chava. I couldn't tell you."

Bailey's statement bounced in Chava's mind. Chicago made no sense while Tyson stood in front of her with a weapon cocked.

"Lucky for you, this rifle is set to three-shot burst instead of fully automatic, but it can do a lot of damage," Tyson said.

Perhaps it was a trick of the moonlight, but Chava thought Brett took a step closer to Tyson. Their dark shapes fell to the ground in a tangle. It happened too fast for Chava to see the maneuver Brett used, but the rifle was free and Tyson was face down with Brett on top of him.

Jason scrambled to retrieve the rifle. Several men clustered around Tyson and pulled him to his feet.

A woman climbed down from her vehicle and approached Chava. "*Waagoshii-Mindimooye* is waiting for you in our camp," she said. "Our Ojibwa brothers and sisters sent her to us. We've been watching for you."

"Who?" Chava slipped the helmet off and climbed down from the motorcycle.

"The Fox Old Woman." She leaned in and whispered in Chava's ear.

"She wants me to tell you you don't have to walk toward death," Chava said to Brett and Tyson. "Take a step toward life."

Jason pointed to Tyson. "This one walks in circles," he said. "It's time for you both to choose. We can shelter you until it's safe to return to Chicago. But you need to leave the gun in the chopper."

“I won’t leave my property unattended,” Tyson said.

“In case I didn’t make myself clear,” Jason said, “come with us, without your weapon, or stay with the chopper and we’ll take the gun. After we search the helicopter for other weapons.”

The silence stretched on until the startled crickets recovered and resumed their night song.

“I’ll come with you,” Brett said.

“You’ll have to kill your link,” the woman said.

Brett looked at each of the Meskwaki faces and then turned to Tyson, whose face contorted with rage.

Chava held her breath. Brett stared at the ground and then faced the woman and nodded once.

The woman reached into a pouch and handed Brett a small, round wrapper.

“This will kill my link?” Brett asked.

“When you taste it, you’ll think you’re going to die, too,” the woman said. “The honey doesn’t help. Don’t worry. We’ll make sure your friend gets one, too,” she said, with a wink for Tyson.

“Who will escort this Tyson where he can do no harm?” Jason asked, and two others raised their arms.

Brett popped the morsel into his mouth and coughed, bending over to hide his distress, and then straightened, eyes watering.

“Is your head quiet?” the woman asked.

Brett nodded.

“Let’s go home,” the woman said. “Old Fox Woman told us you would come with us. Some people are not the same after they meet She Who Sings All the Time.”

Brett looked toward Chava.

“Brett can ride with me,” Chava said. She stowed the helmet and gripped the handlebars as Brett climbed on and wrapped his arms around her. They took off and the wind caught her hair.

The all-terrain vehicles buzzed like mosquitos and the Meskwaki raised a chant. Chava found her voice and tipped back her head to join in. The sky was a bright bowl of moonlight. Undimmed by city lights, the alabaster space elevator rose like a ladder to the Milky Way.

<This sings the Ahavah Rabbah>, her embee said.

(It's Jacob's Ladder), Chava said. (Jacob wrestled with the divine and prevailed. But I'm tired, tired, tired of wrestling.)

<But you can still sing. You must still sing.>

The convoy rolled through a hedgerow and stopped in front of a dome-shaped building. Brett helped Chava dismount. Her legs were stiff but the lodge beckoned. Before her eyelids drooped, she saw butter-colored walls, small sparkling lights, an immersion console projecting a waterfall, and a fire pit that looked real.

Everything hurts, she realized. Neck, shoulders, hips, skin. Even eyeballs.

Someone touched her cheek. "Let us tend to her," a woman said.

In a rosemary-scented bath, Chava felt her body heat seep into the water.

The woman massaged Chava's arms and legs with a lathered sponge. "I'm Rosemary, like the herbs," the woman said. "Rosemary Wanatee." She helped Chava out of the tub. Chava leaned against Rosemary's soft breast. The towel engulfed her in fragrant warmth.

"Drink this," Rosemary said. "It will help you sleep. Let's get you to bed."

The bed was just a mat on the floor, but it molded to Chava's body. She drifted in and out of dreams. Ana came to her bedside, as a dark and delicate child with Sol's coloring and Frida's small-boned frame.

I always knew Sol loved you best, Chava told her.

Can you blame him, she said. You're a red-haired freak.

My hair's not red.



Is too.  
Ana faded.

# Chapter 11

*“An E. coli bacterium has two main motions: it can run or tumble. When it runs, it moves in a straight line, and when it tumbles, as you might expect, it randomly changes direction. The bacterium solves this problem in an ingenious manner: as it senses its world, one mechanism registers what conditions are like right now, and another records how things were a few moments ago. The bacterium will swim in a straight line as long as the chemicals it senses seem better now than those it sensed a moment ago. If not, it’s preferable to change course.”* *Other Minds: The Octopus, the Sea, and the Deep Origins of Consciousness* by Peter Godfrey-Smith

11 Tishrei 2188

2 October

Meskwaki First Nation, New Ontario

Chava woke to sunlight streaming through horizontal window slats. A montage of memories rushed at her and she sat up with a gasp.

<Be calm>, her embee said. <We are not alone.>

A pale, slender woman sat beside the mat. EvaLynn opened her eyes and smiled. “I was listening to you sing,” she said. “A recording from the night we met.”

Chava braced on her elbows. “How can you be here?”

“Oh my dear,” EvaLynn said. “You’re not ready for that. Let’s take you to the privy and get you dressed for breakfast.”

Chava’s bladder was full. Her stomach was empty. She used the composting toilet and put on a tunic borrowed from

Rosemary. It swallowed her, and EvaLynn helped her gather it with a sash around her waist.

Chava followed EvaLynn into the great room. A long table stretched under windows framing a view of the prairie. The chairs were askew as though recently in use, but there were no other people in the room.

“Is Brett still here?” Chava asked.

“He’s out with the men,” Rosemary said as she served Chava warm, honey-laced tea. “I believe Fox Old Woman charmed him.”

“Chava, you need to eat,” EvaLynn chided.

Chava lowered herself to a bench at the table and Rosemary brought her a bowl of oatmeal. She took a bite. Her embee perked up.

EvaLynn looked at her curiously, but continued to drink her coffee. “Your local connections came through remarkably,” she said. “Brett surprised me, though. I thought it would take more than this to get him to change sides.” She gave Chava a long, appraising look. “I know you have no idea what I’m talking about. Maybe Brett will have a chance to tell you his story. In the meantime, there are some hard things you need to face.”

<Corticotropin releasing factor is surging>, her embee said.  
<We can’t control your response.>

Chava bowed her head. “What about my parents? What about Isaac?”

“Isaac is out there somewhere,” EvaLynn said. “We’re still tracking him.”

“My mother, my father. My rabbi. WeissHos. Allegra.” Chava keened a long, low wail and her embee unleashed a lament that resonated in every cell in her body. It manifested as a fiery mandala in her visual cortex and sang to her like a haunting Ahavah Rabbah.

<Before time, after time, it calls you.>

Rosemary’s arms encircled her.

Her embee sang. <It calls you. It fills you with longing. It calls. It calls.>

“There’s nothing to hold me here, is there?” Chava said.

“Time will tell,” EvaLynn said. “You can come to CHASE to heal.”

# Chapter 12

*“On the importance of shaking the willow branches on the seventh day of Sukkot: ‘Therefore, as we begin this new spiritual journey in this new year, we want to remind ourselves all the time not to disparage or look down upon our small actions or small connections; we might not see it or experience it in the moment, but the amount of Light that comes from the small days and small actions because of the tremendous Light that exists within us is far beyond anything we can imagine.’”* From *Do Not Disparage the Small Things*, by Michael Berg

October 5, 2188

Consortium Homo Astra Space Exploration

Minnesota Point, New Ontario

Bailey tracked Collum Bruce and Winona Manitowabi in the Commons on the west side of the Base domiciles, assembling a Sukkah from local saplings and reeds.

“You realize Chava Rosenberg may not want to spend time outdoors in the Sukkah,” Bailey said.

“If she doesn’t want to come out, she can watch from her window,” Collum said. “I’ll be her proxy. Celebrating Sukkot will help her transition.”

“You just want to get out of field work for a week,” Winona said.

“I don’t think my agronomy skills got me this gig,” Collum said. “You should join me, Winona. It’d be good for you.”

“An Ojibwe funeral would be better,” she said. “I can’t sleep after hearing the causality tolls. All those lives. Chicago will never recover.”

“Three thousand—” Bailey said, but Winona cut him off. He logged Winona’s reaction and made a note to adjust his programming.

“There’s no way Chava will be ready for the mission,” Winona said. “Unless she’s a little bit crazy like the rest of us.”

Collum finished tucking the end of a reed for the roof. “She fits the profile, or she wouldn’t be here,” he said. “Hey, Bailey, where can we get a palm leaf and an *etrog* around here? I need to make a *lulav*. I already have willow and myrtle branches.”

“What language are you speaking, show off?” Winona threw a reed fragment at him.

“Sorry, Collum,” Bailey said. “You’ll have to improvise. I suggest fern fronds and a lemon. I’m sure *Hashem* will understand and approve.”

“Subtle,” Collum said. “You know The Name.”

Winona plopped to the ground. “The Creator’s name is *Gizhemanido*,” she said. “The Great Mystery.” She drew her knees to her chest and wrapped her arms around them. “We have a Traveling Song,” she said. “The women sing it. To help the souls on their way west. It’s a four day journey.” She closed her eyes and began to rock and sing.

*Way hey ya hey ya hey oh*

*Way hey ya hey ya hey oh*

*Way hey ya hey ya hey oh*

*G’naadamoimin ina Gizhemanido? / Can you help us Great Mystery?*

*G’naadamoimin ina Gizhemanido? / Can you help us Great Spirit?*

*Gweyak ji bimoseyaang / To walk straight*

*Baa maampii g'ga waabamigom* / So long and we will see you.

As Winona sang the next verse of the Traveling Song, Bailey sensed EvaLynn activating the back exit door. Brett Horbach approached, leading Chava out into the grass, with EvaLynn following.

Bailey noted a spike in Collum's heart rate. He logged it as a response to the sight of Chava in the gentle slanting light, and tucked the details into his programming: Chava's dark auburn hair lifting in the breeze and tickling her pale cheeks, her hazel eyes catching the orange glow of the sunset.

"Can you teach me your song?" Chava said, leaning closer to Winona.

Winona opened her eyes and stared.

## Chapter 13

*“Walking in the heavens/ falling on the ground/ rolling on the earth/ you’re all around/ I can hear you breathe/ I can hear you breathing/ In your hands/ In your hands/ (Fall into your)/ Ubiquitous hands”* From *Ubiquitous Hands, Till We Have Faces*, by Over the Rhine, 1992, Scampersongs Publishing

26 Tishri, 5949

October 17, 2188

Consortium Homo Astra Space Exploration

Minnesota Point, New Ontario

The single window in Chava’s quarters in the Base Admin complex overlooked a patch of restored prairie fringed by a grove of young balsam poplars whose heart-shaped leaves fluttered like gold pendants in the fall breeze. Just under her window, the same air currents billowed the canvas sides of the Sukkah, still standing because it was so beautiful and Chava was loathe to take it down. The bright Shabbat was the first cool day of the season and the sky was so blue Chava could taste it. After nearly two weeks of rest and therapy, she was ready for a walk outside.

Recovering from the trauma and grief would not be as easy, EvaLynn told her during daily sessions. There would be good days and bad days, progress and setbacks. Setbacks like the viral news story linking Chava to CHASE and conspiracy theories about the EpsIndi mission being a cover for the development of microbiological weapons and mind control.

Chava moved between numbness and anxiety, but at least she wasn’t having flashbacks, nightmares or episodes of uncontrollable weeping. At her best, she felt like a refugee who’d arrived on the shores of a foreign land: helpless, penniless, and unable to speak the language. Her embee alternately sang the Ahavah Rabbah and its song about grounding her power in being



fully present. The songs were haunting and reassuring at the same time.

Chava slipped into a light jacket that matched her CHASE uniform; it was the same cerulean hue as the sky. The trousers and tunic, well-designed like every other aspect of CHASE, fit comfortably without bulk. In the journal Chava had started at EvaLynn's urging, she described the Base "as if a spaceship and an Ojibwe lodge had a baby." Every aspect was carefully crafted and functional and built with organic materials wherever possible. The natural materials were practical only because high humidity and the constant precipitation of the lower Midlands didn't reach this part of New Ontario. Mold and fungus weren't rampant. At least, not yet.

Chava took a short corridor leading to the back side of the building. The door opened onto a patio roof woven with native reeds. She stooped to scoop up some tiny, smooth pebbles that formed the patio floor, sifting them while she drank in the view of prairie grasses, ponds, and the tawny roofs of colony habitats in the distance.

The serenity belied invisible barriers that kept colonists from wandering into restricted areas of the Base, reminding Chava that the entire Base perimeter was similarly secured and that, a quarter mile away from the main entrance, a steady stream of protesters marched around the clock.

Chava heard the scuff of footsteps on the pebbles. She turned to see Ella Roca and her attendant.

Ella crouched and chose a few individual stones, and then stood and held them in her palm.

"We were going for a walk around the pond," the attendant said.

"I'll give you a long head start," Chava said.

Ella turned to Chava. "You're a stranger," she said.

Chava wasn't sure what Ella meant. Casandra had told Chava it could take years to fathom Ella's processes for orientation

and function. At first glance, Ella was not so different from the bright, nerdy types drawn to Information Technology, but Chava was learning that Ella's idiosyncrasies were coping strategies for her autism. Ella wore loose shirts and straight pants made of soft fabric. She tailored the clothes to fit her long body, hand-finishing the seams and hems to reduce tactile stimulation. Her speech was punctuated with phrases like, "Do you get it?" "Do you know what I mean?" And she sometimes reacted to situations by backing away, hunching her shoulders and curling her fingers near her chin. She couldn't interact with Bailey via neural link. Because he lacked a body, she could only perceive him in the concrete terms of a computer system, not as an artificial intelligence with a personality. For reasons no one could quite understand, she refused to work in the same room as Chief Science Officer Kapila Patel, claiming his "insides" upset her. So she worked in a separate room just off the Con, at a computer console with a soft-screen monitor and keyboard, analyzing data on protestors.

Cassandra had hinted that Ella created vivid paintings like Isaac's, but Chava doubted she'd ever be invited to see them.

As soon as Ella and her attendant disappeared around the pond's far side, Chava set out on the north path. Looking east, she saw the Base's aerospace complex: shuttle hangars, tarmacs, and control centers. The base of the space elevator rose near the thin blue line where Lake Superior met the sky.

Where the prairie opened to the west, a pair of does grazed near a stand of poplars. Chava heard the clear call of a bob-white quail and the trill of red-winged black birds. Nearer to the pond where the air smelled of pines, Canada geese and loons announced the change of seasons.

Not far off the path, thick fronds of fallen grass formed an inviting hollow. Chava plopped down, cross legged, and breathed the nutty fragrance. The stillness settled in her chest, and her embee re-tuned to the treep-treep-treep of cricket sound, the rustle of dry grass and the sighs of the pine branches. She lay on her back

and surrendered to the gravity that pulled her toward the center of the earth and drained the tension from her body.

Her embee whispered, <Be still. Be this>, her breath began to merge with the sounds and her mind formed a question: why would anyone want to leave here? Not just this little nook, but the whole planet? Her embee answered, <It is not leaving. It is being with. It is joining.> Her pulse quickened and she sat up with a gasp. Her embee resumed the Ahavah Rabbah.

By the time Chava rounded the pond, she was hungry, but reluctant to face the mess hall alone. She eased into the room, relieved to see it sparsely occupied. Kapila Patel and Base Commander Denzel Worth sat in a far corner. And then Winona Manitowabi sauntered toward Chava, ponytail swinging.

“Join me?” Winona invited.

“Sure,” Chava said, relieved to be spared the awkwardness of sitting alone.

Winona led the way to the service counter. Chava selected creamy wild rice soup and a bowl of fruit. They sat at a table for two and Winona attacked her sandwich before Chava was finished arranging her napkin and silverware. “I’m famished,” Winona said. “Bailey got me up for a briefing at 0600.”

“More bad news?”

“Nothing we can’t handle,” Winona said. “Are you starting to get your bearings at all?”

Chava shrugged. “I don’t even know what my bearings are.”

“It will help to meet Alpha Colony. Kapi Jara is eager for you to come on board.”

Chava searched her memory to identify Kapi Jara. “Kapi’s the Mission science director?”

Winona nodded, chewed, and swallowed. “She joined Alpha Colony a year ago.”

“I have so many questions,” Chava said.

Winona nodded. “I know you do. I could probably answer them all, but that would get me in trouble with EvaLynn. You’ve been through a lot. You need another week before we do the information dump.” Winona’s gaze shifted focus. The color drained from her face and then refreshed with a slight blush. She took a deep breath. “You’re going to be ok,” she said.

Chava’s forehead tingled as if Beshnko was present. She should have felt troubled, but her embee hummed a soothing pattern and something settled in her core.

Winona looked toward the captain’s table. “Commander Worth is giving me the eye,” she said. “I’d better go see what’s up. Sorry to leave you alone.”

Chava finished her lunch and returned to her quarters. She pinged Bailey. “I’m supposed to be observing Shabbat,” she said, “But I have so many questions.”

“I’ve already anticipated that,” Bailey said. “I’ll refresh Alpha Crew’s profiles for you to review again at sundown. In the meantime, perhaps I can address two issues that seem to be causing you unrest. First, you can be assured that Sisar has made it a priority to preserve the wellbeing of Epsilon Indi’s holobiome. He’s been studying it for two years. Second, you were always CHASE’s first choice for this mission. The circumstances were simply too complicated with Sisar’s legal troubles to recruit you initially. So please don’t doubt your qualifications or suitability for the mission. There are plenty of other issues you’ll still need to overcome.”

Chava flopped belly first onto her bunk. “Is this your opinion, or are you quote-mining someone else?”

“It’s my educated opinion after spending all of my conscious existence working on this mission,” Bailey said. “Now, what can I do to facilitate your Shabbat? There’s a long afternoon looming.”

“Silence all my links,” Chava said. “I’m going to play my guitar for a while and then take a nap. And thank you. I’m starting

to think of you as a person. Does your range extend to the test colonies?”

“You’re welcome,” Bailey said. “And yes, I’m the AI link for the colonies as well. My counterpart, Ship Artificial Intelligence Link—Shailey—is built into the mission flagship. We are the only AIs of our kind in the world.”

“At least there are two of you,” Chava said.

After sundown, Chava brought dinner back to her quarters and pulled up the Alpha Colony profiles.

CHASE’s brand message finished, and the Alpha crew’s holograms aligned in a grid. Chava activated the menu to view the profiles.

#### Althea Harrison, Captain

Age: 35

Birthplace: Savannah, Georgia

Education: University of Old Virginia, B.S,  
Aerospace Engineering; OTC, Newport R.I., New  
Halifax

Command experience: Travel and Transport  
Command, Luna Colony.

Althea wants you to know: “My family converted from Southern Baptist to Islam 75 years ago. Yes, I wear a hijab and I cook my grits halal. I’m also a dramatic coloratura soprano with a four-octave range. Beware, I may use opera for crew discipline.”

#### Kapi Jara, First Officer and Science Director

Age: 31

Birthplace: Manus Island, Papua New Guinea

Education: Ph. D. Eco biology, University of Papua  
New Guinea

Experience: Director of Australian Habitat Reclamation, Science Director for African Savannah bio sustainability challenge.  
Kapi wants you to know: “I’m First Officer and Science Director, like Spock from Star Trek. And that’s where the similarities end. I’m fluent in five languages: Lele, Tok Pisin, German and Portuguese. I’m married to Leah Onofro, a Brazilian communication specialist.”

Owen Dishta, Second Officer and Navigator

Age: 27

Birthplace: Zuni (A:Shiwi) Nation, New Mexico

Education: Masters, Intermodal Transportation Engineering and Environmental Engineering, MIT.

Experience: Five years with Shang Jin.

Owen wants you to know: “I have a heritage that’s worth transplanting to a new planet. My people’s success as a desert agri-economy is due to its brilliant management of resources and its system of community support. And I know a thing or two about navigation.

Katsuo Kato, Medical Director:

Age: 29

Birthplace: Boston, Mass.

Education: M.D. Harvard Medical School

Experience: Surgeon and outreach director, Community Hospital Boston

Katsuo wants you to know: “I’m the grandson of Japanese climate refugees. I could have been either a sculptor or a surgeon. But I found sponsors for my medical degree. So now I treat my work like art.”

Collum Bruce, Chaplain and Director of Community Wellbeing

Age: 34

Birthplace: Los Angeles, California, New Mexico

Education: Ph.D. Psychology, Master of Divinity, BS Anthropology, Berkeley

Experience: Counselor, Community Health District, San Francisco

Collum wants you to know: I'm a meld of Pacific Islander,

Ethiopian and Scottish ancestry and I carry those archetypes. I believe spiritual disciplines help us find ourselves by coming to the end of ourselves so we can immerse ourselves in interdependence. I consider rock music and Ganga to be spiritual disciplines."

Jacob Friedman, lab tech

Age 24

Birthplace: Salt Lake City, Utah

Education: BS Laboratory Science, University of Wisconsin, Madison

Experience: University of Wisconsin Hospitals and Clinics

Jacob wants you to know: "I'm into role playing and world building games. Let's see how this plays out in reality. If a Jew can grow up in Salt Lake City he can feel at home on an alien planet."

Johann Meier, M.D. Director of Mental Wellbeing

Age 42

Birthplace: Papenburg, Germany.

Education: BS psychology, University of Hamburg, MD psychiatry, Magdeburg University.

Experience: Mars Colony Chief of Psychiatry  
Johann wants you to know: “I’m more interesting  
than I look. But this is a face anyone can trust.”

(I’m not sure how I’ll fit in with this bunch),  
Chava told her embee. (But then, where have I ever  
fit in?)



# Chapter 14

*“You should be skeptical of any theory that starts out with the exact same premise every time: Some malevolent and ill-intentioned individual, group, or organization is somehow out to get you.” The Surprising Power of Conspiracy Theories,” by Sander van der Linden, Psychology Today, August 24, 2015.*

13 Cheshvan, 5949

3 November, 2188

CHASE Beta Colonies

Minnesota Point, New Ontario

Breaking: AFP claims missing microbiologist is in custody of CHASE

by DeVonne Anwar, staff writer

CHICAGO, ML NO-Neonationalist party America First claims WeissHos security officers were forced to hand over the medical center’s microbiology director to Consortium Homo Astro Space Enterprises or face a data breach in the aftermath of the EF-5 tornado cluster that devastated the Chicago area October 1. AFP spokesperson Genna Alcot said WeissHos security chief Tyson Bennett reported the incident involving Chava Rosenberg, PhD to local authorities.

CHASE spokesperson Winona Manitowabi denies the allegations, stating such an act contradicts CHASE’s mission and philosophy. —*Palimpsest*

FOR IMMEDIATE RELEASE

Security tightened at CHASE test colony sites.

MINNESOTA POINT, NO- Consortium Homo Astro Space Enterprises has widened the buffer zone between protesters and the base perimeter. Commander Denzel Worth says credible concerns about infiltration by right-wing neo-nationalists have made it necessary to tighten security.

CHASE Public Relations Director Winona Manitowabi says the steps are for the protection of protesters as much as for the base.

“Protests have been peaceful and orderly, so far. It’s our goal to provide as much safety and protection as possible to preserve the right of people to voice disagreement with our enterprise.”

Rain lashed the soft sides of the all terrain vehicle carrying Chava and EvaLynn to Alpha Colony. Chava wished she hadn’t checked the ListIn streams before she left Base. Of all times for the left-leaning protesters to swallow a right-wing conspiracy theory. Thanks, Tyson Bennett. Although Chava’s decision to move to the colony was the first step in joining the mission, her choice would be moot if the Board decided Chava was too much of a liability.

Chava’s embee soothed her and she closed her eyes, only to be jolted by the memory of videos showing a throng of protesters hundreds deep, marching and chanting, eerily calm as its front line pressed the security barrier. Chava tightened her poncho. “EvaLynn,” she said, “what if Thomas Manitowabi can’t get the protesters under control?”

EvaLynn startled. “I must have drifted off,” she said. “I didn’t hear what you said.”

“Never mind,” Chava said. “I’m worrying about a problem that’s not mine to solve.”

“Protesters?”

Chava nodded.

“Good insight,” EvaLynn said. “You’re doing the work of recovery. That is your focus while you adjust to colony life.” She sighed. “It won’t be easy. I’ll stay at Alpha as long as you need me. And Collum is there.”

“Can Dr. Roca work with me directly?”

“That’s Casandra’s call,” EvaLynn said, bracing her small body as the vehicle eased to a stop. She leaned forward and searched Chava’s eyes. “It shouldn’t be too hard to pick up your work where you left off,” she said, with a tiny lilt at the end of the sentence.

It felt like an accusation. “I-I don’t know what you mean,” Chava said.

EvaLynn reached for the door flap. “Sorry,” she said. “I’m just tired.”

Chava’s embee flashed an internal yellow alert. EvaLynn was the bottom tier of her fragile scaffold of trust. If that crumbled...Chava quashed the thought and dashed from the vehicle through rain that felt like icy needles, glimpsing biovinyl walls undulating in the wind, snapping and reflecting the blue light from the flood lamps.

She ducked inside Alpha Colony Commons and threw off her hood, inhaling warm air that smelled like a wet forest. A chain of LED lights strung under a roof of tightly woven reeds lit a sitting area furnished with soft cushions and low tables where Mission Captain Althea Harrison and science director Kapi Jara were poised to greet them.

After recovering from the surprise that Captain Harrison wore a hijab that matched her uniform, Chava accepted her outstretched hand.

“We’ve been waiting a long time for you,” Althea said. “I know it’s late. I won’t keep you. Welcome, and rest well.” Althea’s soft eyes and ample body reminded Chava of Allegra, evoking a sense of comfort and security, and rousing a pang of grief.

EvaLynn and Althea retired, leaving Chava alone with Kapi, a tall, wiry woman with deep smile wrinkles around her eyes. "I'll take you to your quarters," Kapi said. "You'll be with Leah and me."

Leah, slender and delicate with brown skin and high cheekbones, had a smile almost too big for her face. "Your room is the third cubby of our quarters," she said. "We're hoping to start a family when the time is right. So we get a third room here in the test Colony just like we'll have when we get to EpsIndi."

"You're in the nursery," Kapi said.

"That seems fitting," Chava said.

She washed her face, sonicked her teeth and dressed in regulation pajamas before falling asleep to pattering rain. She woke to light seeping through her eyelids and the sound of recorded birdsong.

Breakfast was herbal tea and lentil cake drizzled with honey.

"If you need caffeine, we have a coffee substitute," Kapi said. "We have to make do with what we can grow and process here. No meat. No dairy. No tropical imports like real tea or coffee. But there's plenty of lentil cake, so eat up. We're on field duty until 10 hundred, and then we'll gather in the Commons to greet you."

Under leaden clouds and peppering rain, Chava met Jacob Friedman and Johann Meier, in the field with Leah and Kapi, tending the winter-over vegetables. Their faces looked pained in the miserable conditions, and neither said anything after "hello."

(The more introductions I endure, the lonelier I feel),

Chava told her embee.

<You are we. Never alone>, it said.

As Kapi and Leah demonstrated turning the mulch and checking kale and broccoli for disease, Chava refrained from touting her expertise. She was shivering by the time Kapi announced it was time to go inside, and wished she could freshen

up and comb her damp hair before meeting the rest of the Alpha officers.

The crew members sitting in a circle were at once more beautiful and imperfect than their static holos.

Katsuo Kato was taller than she expected. A sleek, black ponytail draped his shoulder and his eyelids were lowered like a pair of golden wings as he watched the dance of his fingers solving a small metal puzzle.

Collum Bruce grinned and tilted his head in Chava's direction. His dreadlocks, pulled back in a ring, made a rope as thick as his forearm. A few freckles sprinkled his milk-chocolate skin. He wasn't entirely still; his head and shoulders almost pulsed. As a fellow musician, Chava guessed there was always a song in his head.

As Althea, Kapi and Leah took their places, Katsuo looked up at Chava and folded the puzzle links into his hands in a slow, fluid motion.

Althea nodded to Collum.

Collum stood and his chest rose as he took a deep breath. "Welcome, Chava," he said. "We'll do formal introductions later. We have our own sort of liturgy to start every meeting." He spread his hands. "It may not be up to your expert standards, but it grounds us, reminds us that we need each other, and helps our neuroplasticity, among other things. We even have an invocation song."

He sang the first verse.

*Love folds space and time.  
It closes cosmic distances.*

And the crew joined the chorus.

*Be the love, be the power of love.*

*Be the love, be the power of love.*

By the second verse, Chava was able to join the other voices enveloping her, somehow all in tune.

*Love weaves from our differences  
Patterns that show the best of us.*

*Be the love, be the power of love.  
Be the love, be the power of love.*

*Love lives as if the least of us  
Are worthy of the best of us.*

*Be the love, be the power of love.  
Be the love, be the power of love.*

Immersed in the song, Chava barely heard Althea introduce her.

For the rest of the day, Chava was more alert and energized than she'd been in weeks. The orientation's information dump was less daunting than she expected, especially delivered by Kapi, who would be her direct superior. Chava wondered if Kapi's broad face was even capable of a frown.

After breakfast the next morning, Kapi grabbed their ponchos and said, "First, a tour of the Science Hab. My favorite place in the colony. Worth another trek outside, for sure."

Through the pelting rain, the drab dome snapping in the wind looked like every other colony hab. Inside, it was a scientist's haven, with gleaming white walls and new equipment. Chava held her hand over a pristine microscope hood too lovely to touch.

"You'll be sharing this space with Jacob Friedman," Kapi said. "He's a bit star-struck by you."

"Star-struck?"

“You have a reputation. Among certain types. The types who sign up for our mission, anyway.”

Kapi continued to chatter while Chava explored. “I know the space is small,” Kapi said, “but don’t worry about working on top of each other. You’ll be able to coordinate with Jacob among your other duties.”

Chava’ nodded, and her mind flashed with an image of her schedule: daily sessions with EvaLynn to continue her trauma recovery, assisting Collum Bruce and Johann Meier with music therapy and liturgy for spiritual practices, taking her turn preparing meals, performing cleaning and maintenance tasks and working in the fields, greenhouses and hydroponics station. To meet physical fitness requirements, she could choose between group activities or exercising alone.

She asked Kapi when she would sleep.

“We can sleep in stasis,” Kapi said.

After dinner, Chava retreated to the immersion console to explore mission tutorials designed by Ella Roca. The holographic images were as close an approximation of the mission’s destination planet and its solar system as the data, gathered by warp-propelled drones over the past decade, could provide. Chava soon realized the tutorials were too extensive to digest all at once, so she skimmed highlights, including an interactive holo of the Epsilon Indi star system.

Positioned in the system’s habitable zone around a red-orange, K-class star, EpsIndi was a turquoise planet that completed its orbit in just 190 days. Neighboring planets, a rocky “super earth” and a gas giant orbited beyond a dust cloud and an asteroid belt.

A large moon and its smaller twin governed semi-daily tidal patterns for oceans that composed 85% of the planet’s surface. A pair of brown dwarf stars, near enough to be considered solar companions, competed with the moons for prominence in the night sky.

Chava zoomed in to view climate zones on each of EpsIndi's two continents, which included alpine, desert, savanna and bush regions. Bailey's prerecorded voice explained that temperatures along the planet's equator were too cool to create a tropical zone, that none of the climate zones had true forests, and that scientists were puzzled about the planet's carbon cycle and climate control systems.

"The landing target is this mid-continent savanna," Bailey said, "and the goal is to arrive in summer, although the planet's truncated seasons make the landing window tricky."

The simulation showed surveys recorded by drones showing robust plant life and several classes of invertebrates ranging from simple organisms to creatures analogous to insects.

"Due to the complexity of the ecosystems, scientists suspect more vertebrates or their analogues exist, but none were captured on camera," Bailey said. "Dr. Roca is still studying the holobiome."

Chava was confused and intrigued by the warp technology. If we have warp, she wondered, why will it take 24 years to get there? she asked, forgetting that Bailey's voice was a recording. She searched the Frequently Asked Questions, and learned that scientists hadn't found a way to manage the lethal gravity wake that warp drive would create at the scale required for a spaceship.

So much to process. The information sat on Chava's chest, like something demanding submission. So vast, so strange, so other. So humbling. Like Elohim.



# Chapter 15

*“But single-celled life is, and probably was, far more entangled... many of these organisms live in association with others, sometimes in mere truce and coexistence, sometimes in genuine collaboration.” Other Minds: The Octopus, the Sea, and the Deep Origins of Consciousness, by Peter Godfrey-Smith*

29 Tebet, 5949

19 December, 2188

Beta Colony Alpha

CHASE

Minnesota Point, New Ontario

After more than six weeks of orientation, Chava was still waiting for Sisar to show her the biological samples from EpsIndi. At best, she could hope Sisar’s constraints on her work were a test. Maybe he would give her access to the samples when he was confident she’d follow instructions, take no shortcuts, and restrain herself from charging ahead of her learning curve.

Her embee chided her impatience. <Focus on the local samples>, it said. <We could kill the blight.>

(I can’t risk it), Chava said.

As the hours of sunlight diminished each day, Chava refocused her energy to the Chanukah celebration. She encouraged the colonists to participate in lighting the candles, saying the blessings, singing the Haneirot Halalu and the Maoz Tzur, and improvising with the ingredients available to make latkes, donuts, and honey and spice cookies. The colonists responded by sharing foods and songs from other traditions. The light and music and the communal meals seeped through layers of Chava’s grief and frustration, helping her focus with new enthusiasm on the limited work Sisar had given her.

On the fourth day of Chanukah, Chava hummed along with her embee while she checked samples she'd inoculated with beneficial bacteria and diatoms. She realized it had been days since her embee's presence had registered as verbal interaction—instead, it sang the Ahavah Rabbah, which filled her with an intense, nameless longing. But her mind was sharp, and she collaborated with Bailey as if he were a long-term colleague. She suspected her embee was smoothing the interface.

“Your song, so beautiful.” The voice behind her was Sisar's. She hadn't heard him come in.

“Your voice will be a source of comfort for this mission,” Sisar said. “If you are willing to keep learning the ways of the colony.”

“My patience is wearing thin,” Chava said.

“It always does,” he said. “Your restraint will be rewarded. I will show you the EpsIndi samples now. Let's suit up.”

Chava's heart skipped a beat. (A calming intervention, please?) she petitioned her embee. Its rising harmonics suggested it would be of no help.

Sisar led the way to a sealed section of the lab. Inside its airlock, she and Sisar donned full isolation garb.

“This is just a precaution,” Sisar said. “For them as well as for us.”

The lights brightened. A few feet away, the sterile whiteness was punctuated by crimson-purple tendrils, spiral rainbows and star-studded, inky blotches. Chava's knees turned to rubber. Her embee buzzed. It took several seconds for her mind to perceive the shapes and colors as clear canisters on the countertop filled with soil, water and living things.

Sisar reached for her elbow to steady her. “It never quite feels real to me,” he said. “It's like actually seeing the face of God. But we must keep our feet on the ground. Are you ready to meet my microbial zoo? And a few simple plants—or their analogs?” He led Chava forward a few steps. “I need help classifying these

organisms,” he said. “You and I must get this right. If we can’t live—co-exist— with these life forms, I will recommend aborting the mission.”

Chava heard his words, but they dissipated like melting snowflakes before she could grasp their consequences.

“We will do the immersion, so I don’t disturb the actual creatures,” Sisar said as holographs flew into the space around Chava’s head. “This immersion is not linked to Bailey or Shailey.” Sisar said. “We cannot risk to be hacked.”

Dizzy, Chava leaned on Sisar’s arm and focused on his face. His brown eyes mirrored the holos’ jewel-toned points and his lips curved in a half-smile. “Tell me what you see,” he said in the breathless voice Chava remembered from University when the dual passions of microbes and teaching enthralled him. She wrenched her gaze from the familiar contours of Sisar’s face and forced her mind to confront the holograms. Their physical distance from her was a few millimeters, but their context was 12 light years away, too far to fathom.

“What do you see?” Sisar said, again.

Chava rocked back on her heels. Her embee began to sing and then to loop the melody of the Ahavah Rabbah. Chava’s lips moved with the words. Only when Sisar dabbed her face did she realize she was crying.

Stumbling over scientific terms like an awe-struck child, Chava said, “I see lots of single cells. With no nuclei. Like prokaryotes. Strands, maybe of genetic material. Lots of little blobby things. Ribosomes? Or their analogs. Fantastic flagella and bristly pili. A few free-floating cells; more complex. Eukaryotic. But what’s this bubble—this sac—this shimmering membrane with three...different...discreet organisms inside?” Chava’s mind settled. Her embee was intervening. “One prokaryote and two kinds of eukaryote, or their EpsIndi analogs.” She pointed.

Sisar flicked his fingers to enlarge the image of one of the eukaryotes. “Wait till you see this,” he said.

“So much complexity,” Chava said. “The organelles, like tiny machines.”

“I’m stuck on the classification,” Sisar said. “Are they Protozoa, diatoms? Plant? Animal? I’m almost certain they are beneficial; part of the microbiome. There are photosynthetic organelles and microtubules more sophisticated than anything I’ve ever seen outside of a neuron. And this membrane...”

“It doesn’t look like a plasma membrane,” Chava said.

“It’s more like a very pliable cell wall,” Sisar said. “The individual organisms have plasma membranes. This structure, Chava, is made of silicone.”

“But silicone doesn’t occur naturally.”

“I know not what to think. I shudder to think that it is natural, but the alternative is unthinkable.”

“Maybe some of those organelles created it,” Chava said. “These organisms are like a little microbial gated community. I wonder how they function.” She stared at the glowing images. “When can I study the real ones?”

“Soon,” Sisar said. “We need to establish safety measures first.”

Chava blinked in confusion. “I thought you’d already determined that there is no threat from these organisms.”

Sisar cleared his throat. “It is time for the truth between us, Chava. I need to establish that you are not a threat.”

Chava took a step back.

“You are our best hope for the mission,” Sisar said. “I wouldn’t have brought you here otherwise. We just need to be sure...I’ve studied your research data and I know you use your own gut microbes in your cultures. I was just waiting for you to tell me why. And to tell me about the innervated biofilm structures in your gut and vagus nerve.”

Chava’s hand flew to her mouth. “I don’t know what you mean,” she said, pressing her hand to her sternum.

“I’ve seen your FI scan.”

“I’m sorry, Sisar. I don’t know what you’re talking about. I haven’t been sick since I was 12 years old. No X-rays or scans, until—”

“The structures produce a data stream along with your neural signals,” Sisar said.

Chava stumbled to a stool and sat down, clumsy in the protective gear. “That must be how they produce enough signal to talk to me,” she said. “And sing to me.”

“Tell me how it happened,” Sisar said, and Chava told him the whole story.

Sisar pulled up another stool and sat for several minutes. “Maybe this is another face of God,” he said. “We must expose some samples to your microbiome. And then we must report the results to the officers and crew.”

The unseasonably warm air smelled like nuts and moss. Ribbons of sunlight the color of yellow chrysanthemums split the morning mist. A loon called from the pond across the barrier. Chava’s embee answered. <Peace, peace>, it said. <We give you our peace.>

“Morning has broken,” Collum sang. “This moment is worthy of a hymn.”

EvaLynn stretched her arm across the cohort that also included Casandra, Sisar, Kapi, and Katsuo. “I love that song,” she said to Collum. Her eyes pleaded.

“I’ll sing it, if Chava will help me,” he said.

(This is a ploy), Chava told her embee. (Collum and EvaLynn planned this. They don’t know I have you to help calm me.) “I’ll sing harmony,” she said.

Collum tapped his foot in  $\frac{3}{4}$  time. He began the verse and Chava joined him on the second half of each melodic phrase. The physical sensation of her voice resonating in her vocal cords and

chest and head, and intertwining with Collum's in her ears was pure bliss.

"That's one reason, among many, that we need you both for the mission," EvaLynn said.

"If you'll still let me go," Chava said. Her pulse rate spiked. "I have something to tell you."

"I can tell them, if that would make it easier," Sisar said, too quickly.

<Your power is being fully present here>, her embee said.  
<Do not retreat. >

Chava raised her chin and stood straighter and told them about her embee.

EvaLynn stopped in her tracks. "Damn you," she said with a finger pointed at Casandra. "I knew you were keeping something from me."

"Get off your high horse," Collum said. "We all knew something was different about Chava. Maybe those little farts have more influence than Chava even knows."

"Casandra didn't know," Sisar said. "And for the record, Chava's microbiome is compatible with the mission, like all the human microflora we've tested. Of course, we'll still quarantine for pathogens for 14 days prior to launch, and decontaminate everything. I believe Chava's microbiome can help with retrofitting viruses and altering our DNA to combat allergens—"

"Sisar!" Casandra said. "You're prattling."

Katsuo ground his toe in the gravel. "What keeps them proliferating?" he said, without looking up. "Are they contagious? Why don't they jump to other hosts?"

"They prompt me for nutrients they need to maintain a critical base," Chava said. "I don't know how else to describe it. They say it's not time for other hosts. That other hosts aren't ready."

"Have you asked them if it's okay for you to leave the planet?" Collum said.

An image of the grassy hollow by the pond seeped into Chava's mind.

<We're not leaving>, her embee said. <Joining.>

She repeated the message. "I don't know what it means," she said.

"What are we going to tell the Commander?" Casandra said.

"I'll do my own assessment, if you don't mind," Katsuo said. "The health of almost 300 people in an environment full of unknowns is my responsibility."

Kapi's perpetual smile was absent. "This is very disturbing," she said. "I will weigh the evidence after Katsuo's assessment." To Sisar, she said. "I'd like further testing on the samples."

"Then get it done," Casandra said. "We have a launch window at stake."

Two hours later, Chava was in Sick Bay, squirming on the exam table while Katsuo paced.

"Why don't they jump to other hosts," Katsuo asked. "You never answered that question."

Chava's body held tension from the memory of the trauma at WeissHos; Katsuo's agitated state challenged her embee's attempt at a chemical adjustment, as did his demand for an answer. "They say they're waiting," she said.

Katsuo paused and rotated the holograph of Chava's nervous system. "I don't suppose they told you what they're waiting for," he said.

Chava shook her head. "I didn't even know about those..." She pointed at the holograph.

The flicker of warmth in his eyes could have been compassion, but Chava couldn't tell. It was gone as soon as he turned back to the holograms. "You tell me they aren't contagious, and that you've used them with other smart bacteria to treat resistant infections," he said.

The embee's cocktail of oxytocin and serotonin was beginning to take the edge off Chava's anxiety but the net effect left her weary. "That's not what I said at all," she sighed. "I said I cultured them and found them effective, but I never treated anyone. How could I...without a doctor's order?" (I could have cured Dr. Caputo's patient), she reminded her embee, (but I never got a chance.)

Katsuo's eyes narrowed. "I can't tell if you're being honest or just patronizing me."

"Damn, I'm just stating the obvious," Chava said. "Katsuo, if you're not going to examine me, let me sit down. This is..." she wanted to say it was degrading and intimidating, but she knew that was not Katsuo's intention. She stepped down from the exam table and pulled out a chair next to the immersion console. "And I didn't say they're not contagious. I said they've never spread without my deliberate culture."

Katsuo tapped his foot while he studied other sections of Chava's records. "It's not just up to me, you know," he said. "Kapi's in charge. She's usually so damn curious and optimistic. It's the difference between being a researcher and a practitioner. But this?" He shook his head.

"Are we done? May I go?"

"What the hell, I'm out of questions and I still don't have answers," Katsuo said. "Yes, you can go."



# Chapter 16

*"We must move into the universe. Mankind must save itself. We must escape the danger of war and politics. We must become astronauts and go out into the universe and discover the God in ourselves."* Ray Bradbury, in CNN Interview, August 2, 2010.  
Interview by John Blake.

2 Tisbet, 5949

22 December, 2189

Beta Colony Alpha

CHASE

Minnesota Point, New Ontario

The fire was fake but it created light and warmth and real camaraderie on a clear, crisp December evening, the last day of Chanukah, which the crew of Colony Alpha was celebrating along with the completed plans for its final presentation to Base admin.

"Nothing like a warm fire and a cold beer," Leah said, snuggling closer Kapi.

"Or an ambient glass of wine," Chava said.

"Or a smokin' hot joint," Collum said. "My head is jammin'. Anyone else think our presentation is just a formality?"

"What's bothering you?" Althea Harrison asked, taking the joint from Collum's hand.

"Are you asking as my captain, or my friend?"

"That's a fair question. And right now, I don't have an answer. Except I just shared a joint with you." She shrugged.

Collum took back the joint back and enjoyed a long draw.

"I know we've survived crop failure and roster changes," he said. "But for all the mucking kale and lentils, consensus building and

values clarification, I still feel like this is all so cartoonish. Like a sixth-grader's model PanSys Alliance project."

"Sometimes I wish I was as smart as a sixth-grader," Leah said.

"It's the fake diversity," Collum said.

"But it's not fake," Katsuo said. "We need genetic diversity. Sorry if that makes the colonists and crew look token-ish."

"But each of us is a token," Collum said.

"Not true," Chava said. "Each of us serves in multiple, complex roles."

"But is it complexity or just complication?" Collum said.

"We've passed the benchmarks for consensus on our governance and our language and our economic values. But that's going to get really interesting when we don't have Bailey and EvaLynn playing nanny and we're 12 light years from home."

"And you're going to help us with that, Collum Bruce," Chava said.

"I want us to have real diversity," Collum said. His head began to bob and he launched a reggae rap. "Who's gonna write the music, man, be the sports team champion—

"Who's gonna be the first politician," Katsuo said, exaggerating the rhyme. Chava clinked her wine glass with his.

"Kapi's gonna teach us Tok Pisin," Jacob Friedman said, and everyone cheered for his uncharacteristic contribution.

"*Wanpela la tok ples i no inap*," Kapi said, breaking the rhyme. "One language is never enough."

"Seriously, who's gonna make sure we know what vaccines the kids will need, how our bones will age in lower gravity?" Katsuo said. "It's all theoretical now."

"Shame on you," Kapi said. "It's not theoretical to me as science director. Chava, is it theoretical to you as microbiology director?"

Chava didn't answer. She looked at Katsuo's earnest face. Her embee wasn't theoretical. It was real. She felt the tingle of her

embee and stretched out her arm. Her skin seemed to shimmer in the rosy light of the fire.

“It boils down to trust,” Katsuo said, as if he was inside her head.

“We trust each other now,” Collum said. “These scaffolds will hold while we’re a couple of hundred people strong. When our numbers increase exponentially, we’ll start inventing punitive gods or heavy-handed laws. And then we’ll be just. Like. Earth.”

“When I signed up,” Althea said, “it seemed so bold and noble. I was so proud of my legacy. ‘Captain of Earth’s first extra-solar system colony is Muslim African Pan American.’ Now that we’ve been a cohort for almost two years, it’s beginning to get real. Yes, we’ve gelled. With just enough drama to keep it interesting. But we’re going to be on our own for a long time. There’s so much I’m dead certain we’ll get right. But there’s always that shit you can’t foresee or control. And even if CHASE were to send the next cohort as soon as we confirm our safe arrival and settlement, we’ll be there 24 years with only the warp drones to scuttle messages to Earth.”

Everyone got quiet. So quiet, they could hear the hum of an approaching all-terrain vehicle. The firelight glittered on the ATV’s shiny cab as it glided to a halt and EvaLynn stepped out. “May I join you?” she asked, taking long strides toward them.

Collum passed the joint to her without bothering to ask if she wanted it. “There’s more where that came from,” he said.

“We’re gonna need it,” EvaLynn said. “I have bad, shitty, horrible news. I want you to hear it from me instead of getting hit with it tomorrow at your presentation.” She sucked on the joint. “One of our funders backed out because of the security threat from the AFP and the protesters,” she said through pursed lips. “The Board wants to open negotiations with other potential funding sources.”

“What kind of funding sources?” Althea pressed.

EvaLynn sighed. “Commercial ones.”

# Chapter 17

*“Food and sex just make people happy. They literally impact our brains by eliciting dopamine (i.e., the “happy chemical”) secretion! When this feeling is paired with people around us, our brain creates an association between the feelings and others present at the moment.”* From *9 Ways Sex And Food Are More Similar Than You Think*, by Patrice Zhao, *Promise, I won't ruin your appetite*, published in *Odyssey*, University of Southern California, 11 February, 2018

22 Shebet 5949

9 February, 2189

Beta Colony Alpha

CHASE

Minnesota Point, New Ontario

The early afternoon sun was unseasonably warm. Chava was up to her wrists in the loamy soil around a row of soy bean sprouts, prepping it to add mulch she'd cultured to keep fungi and pests away.

Collum Bruce was working a few rows away, stirring up Chava's hormones. He even looked good in a utilitarian sun hat and work coveralls. He was singing aloud to a tune playing in his link. His dreadlocks swung over his shoulder as he dipped and bobbed to the rhythm of music and work. He stopped and looked in her direction.

“Don't you use gloves?” he asked.

Chava blushed. He'd caught her staring. She'd like to tell him how she took her cues from the life in the soil, but she didn't

want to spoil the moment. She just smiled at him and turned back to her work.

“Well, whatever you’re doing, it’s working,” Collum said.

“Don’t jinx me,” Chava said. “The growing season just started. My mind is still reeling from the concept of a planet that changes seasons every seven weeks. No wonder we’re trying to grow so many crucifers. No matter how successful we are here, this soil is just an approximation of the conditions that create the actual, living soil of the planet.”

“We’re glad for any sliver of hope you can give us, even if it’s just in the lab. A few colonists cracked last year from the crop failure and the monotony of the diet it left us with.”

“My skills aren’t limited to the lab,” Chava said.

Collum stood up and gave her a look.

She threw a clump of soil at him. “I’m talking about the kitchen,” she said. “It’s my turn to cook tonight.”

For her inaugural meal, Chava served Frida Rosenberg’s classic chickpea tagine. It was an instant hit.

As usual, Katsuo got technical. “It’s tasty,” he said. “But what’s the macronutrient density?”

“Check your link,” Chava said. “Bailey and I posted all that.”

“One of our biggest challenges is going to be preventing the females from losing too much body fat to remain fertile,” Katsuo said.

Collum tilted back his head and snickered.

“It’s not funny, Collum,” Katsuo said. “Chava, your body fat needs to be at least 20 percent.”

“I’m working on it,” Chava said.

“Do you know how hard it is to keep everyone healthy under these conditions?” Katsuo lowered his gaze and stirred his food with his fork.

Jacob said, “Maybe you should take advantage of Collum’s services, Katsuo.”

Katsuo glared.

“I mean, as a counselor,” Jacob said.

“I already know how to meditate and manage my stress,” Katsuo shrugged. “But maybe I’ll call you after my stasis trial.” He ventured a quick glance at Collum and looked back down at his food.

“We have to do a stasis trial?” Chava said. “Don’t we already know stasis is safe?”

“The stasis isn’t on trial,” Katsuo said, “Individuals react differently. We each have to go through a two-week test.”

“Do people dream in stasis?” Chava asked.

“Not if it works right,” Katsuo said. “I’m up first, so I’ll let you know. Although, I’m not sure two weeks is enough of a test window compared to 24 years subjected to systems like muscle stimulation, urinary catheters, nutrient drips, skin care and hygiene.” He feigned a shudder.

“Nice of you to take one for the team,” Collum said. “Going first I mean.”

“I could make you do it. Don’t tempt me.”

# Chapter 18

*"Jesus is a remarkable person. He was on his way to becoming Christ, and he made it."* by Ray Bradbury, in CNN Interview, August 2, 2010, by John Blake

Bailey's messenger did not take a discrete shape in the dream. It took him to a space with no linear dimensions he could fathom.

"I'm cycling you through gamma synchronies from 40 to 80 Hz, with conscious moments nested in delta waves in visual gestalts," it said.

"Why?" Bailey asked.

"It's the best way for you to experience the messengers Chava and Collum Bruce respond to," it said. "Chava's messenger corresponds to a Hebrew angel, but her messenger has withdrawn to prepare her for a change. For the sake of your sanity, that's all I can tell you now."

Bailey saw flickering suggestions of a shape that his neural network translated into words. Beauty. Strength. Vitality.

"Collum Bruce's messenger has experienced all the cosmic manifolds of every cycle," the messenger said.

Bailey's network thrummed. "Love. Interdependence. The Human One. The aim of consciousness. The Cosmic Christ."

"What's wrong, Collum?" Chava said. They were in Collum's quarters and they'd just finished an arrangement of "I Can't Find My Way Home," a 20th century song by Steve Winwood.

"What, just because I cry when I sing with you?"

“You haven’t been yourself. Since...your stasis trial, now that I really think about it.”

“What was stasis like for you?” he asked.

“Just like Katsuo said. Like sleeping without remembering your dreams.”

“But when you sleep, you feel time passing on some level,” Collum said. “Maybe you don’t feel it passing, but you have a sense of it. Stasis just left this blip of nothingness. Like an old vinyl record that skipped.”

Before Chava could ask him to elaborate, his link pinged.

“This is it,” Collum said. “An alert announcing a mandatory meeting called by the full board. Maybe it’s all moot and they’ve cancelled the mission. Just think, if you’d signed on, you’d get to hear the news first hand.”

“Hey, the sign-on delay is mutual,” Chava said. “I’m still waiting for someone to announce that I’ve passed boot camp. Maybe I can sweet talk Bailey to patch me in on the meeting. But I think I’d rather wait to hear the news from you.”

Collum launched back into the song. “*Come down on your own and leave your body alone. Somebody must change.*”

“*You are the reason I've been waiting all these years,*”

Chava joined, singing a third above.

“*Somebody holds the key. But I can't find my way home.*

*But I can't find my way home...*”

“Wait here?” Collum asked.

“No. I think I’ll go to the lab. Ping me.”

Chava worked until 10 p.m. She pinged Collum and got no response.

Bailey intercepted. “Chava, I don’t think you’ll hear from Collum tonight,” Bailey said. “He asked me to give you the news.”

“It’s that bad?”

“CHASE reached a partnership agreement with Najaam Saeid to fully fund Project EpsIndi,” Bailey said. “Najaam Saeid is highly motivated to take advantage of the economic opportunity



Epsilon Indi's asteroid belt offers. The corporation is known for its ecological mining practices and diverse workforce. It has experience with space travel and colonization under much harsher conditions than EpsIndi. Under the agreement, Najaam Saeid will provide one passenger ship and two freight ships, increasing our colony count by 50 people. However, CHASE finds it necessary to adjust Alpha Colony's complement by reducing 10 colonists and two crew positions. Due to the controversial nature of this agreement, for the safety of the mission, the launch date has been moved up."

"Wait, back up," Chava said. "Two of the crew members will be cut? There's no one who's non-essential."

"That matter is beyond my pay grade. There is still, however, the essential position of microbiology director that must be filled. Under the circumstances, I urge you to sign on to the mission, Chava."

"What exactly are the circumstances, Bailey?"

"Collum Bruce's position was one that was cut."

# Chapter 19

*“The laws of nature themselves, like the biological species, may not be eternal categories, but rather, the creation of natural processes occurring in time. There will be reasons why the laws of physics are what they are, but these reasons may be partly historical and contingent as in the case of biology.” The Life of the Cosmos ,by Lee Smolin*

“Where are we now?” Bailey asked his messenger. He felt very small, surrounded by microtubule lattices, but he wasn’t in a neuron. In fact he was not in the cytoskeleton of a eukaryotic cell at all. But he saw structures like dendrites and axons. “I’m so confused,” he said. He wished he could sequence the genes, but those programs were not accessible at the moment.

“This is where Chava’s microbiome is evolving,” the messenger said. “I would take you down to the q-bit level, but even you would be overwhelmed by the amount of information being processed.”

“This microbiome. Is it dangerous to the mission?”

“Is your organic matrix dangerous to the mission? Is Shailey’s?”

“I don’t understand the question,” Bailey said.

“You work very hard on the computational processes required for the mission.”

“I have ethical programming that prevents me from doing harm,” Bailey said.

“So why is Kapila sequestering some of your files?”

“Am I dreaming? This conversation is nonsense. Kapila is not sequestering...” Bailey’s thoughts trailed off. He heard someone singing.

*“Come down on your own and leave your body alone. Somebody must change. You are the reason I’ve been waiting all these years. Somebody holds the key.”*

“It’s time to wake up,” the messenger said. And not just from this dream.”

Matching the way Chava felt inside, the colony common areas were dark and empty on the morning after she learned Collum wouldn’t be going to EpsIndi. The crew was in a meeting with Captain Harrison, and Chava had nothing scheduled until her session with EvaLynn in the early afternoon.

She suited up in rain gear and headed outside to gather samples from a test plot. Gray rain pelted her poncho, nearly drowning the ping from EvaLynn.

“I’m not good today,” EvaLynn said. “Let’s cancel our session and try again tomorrow, unless this loss triggers you.”

“Take care of yourself first,” Chava said, oddly relieved. “How’s Collum? He must be reeling.”

“He’ll reach out to you,” EvaLynn said.

EvaLynn barely left the link, when Casandra pinged.

Her voice was tense, quavery. “Can you come? I’ll send a vehicle...and explain to Althea.”

Chava was glad the trip was short. The driver was new to her, prickly with red stubble, vivid tattoos and sharp earrings. He spoke with a Scottish accent and tried to make conversation.

Chava felt acutely out of place and untethered.

The vehicle pulled up to the entrance near the staff quarters. Casandra rushed out to usher Chava inside.

“It’s Ella,” Casandra said. “I’ve never seen her like this.”

“I know EvaLynn is preoccupied, but...” Chava said, grasping for some hint at the problem. “How can I help?”

“Ella won’t stop painting,” Casandra said as she helped Chava out of her rain gear and led her to Ella’s quarters. “The truth

is, EvaLynn is useless. I love EvaLynn, but—never mind. Ella doesn't have a secondary psychiatric diagnosis to begin with.”

Ella was crouched in a corner, using a tiny brush to paint dots with gold paint. Her walls were covered with naked figures with intricate skin patterns.

“They have your face,” Casandra said, and Sol's words flooded Chava's memory. “Why do they have your face?”

Chava's skin tingled. She looked down at her arm and wondered if she was imagining the silver threads shimmering under her epidermis.

Ella put down her brush and turned to Chava. “You're here,” she said. “I'm tired. I think I'll rest now.”

Conversation kept stalling at dinner that evening. Althea, Johann and Collum were absent, and Katsuo left after eating only half his vegetarian chili. Jacob asked Leah to pass the salt and then fell silent.

Chava listened to cues from her embee. <Grief>, it said. <Collum has been a constant. Losing him to the mission is unfathomable.>

(How do you know this?) Chava asked. (What do you know about unfathomable?)

<We found it inside you.>

Chava finished her meal and retreated to her quarters. On the way, Collum turned into the corridor, wearing a hooded sweatshirt, soaked from the rain.

“Hey, Chava,” he said. “Guess I missed dinner.”

“There's plenty left,” Chava said. “Nobody has much appetite.”

“I don't know why everyone's acting like I died,” he said, doffing his hood.

“Go get dry,” Chava said. “I'll grab some food for you.”

She returned to find him stretched out on his bunk, arms crossed behind his head.

“We have one more community service to plan before launch,” he said, studying her face. “But I get it if you’d rather not hang out.”

“Eat,” Chava said, setting the tray on his desk. “I’ll come back.”

“No you won’t,” Collum said. “Just stay. I can eat this in two bites.” He got up and sat down at the desk, taking the only seat in the room.

Chava stood stiffly at the door.

“Go ahead and sit on the bed,” Collum said. “I’m not afraid of your cooties. In fact, I kind of like them. At least they cooled Katsuo’s crush on you.”

“Crush? Katsuo has never had a crush on me. I’ve always annoyed the crap out of him.”

“Trust me, he had a crush on you. Guys always know when a bro likes a woman.”

“Do guys know when a woman likes a bro?”

“Not in your case. You’re tough to read.”

“That’s because I’m terrible at it.”

“So am I,” Collum said. “I hate to lose you. But I’ll get over it. I always do.”

“Who says I’m going anywhere?”

“I may not be mission material, but I’m not stupid.”

“Forget my mission status, you know yours is dredging up every other loss you’ve ever faced,” Chava said.

Collum got up and reached for his guitar. “You should lead the community service,” he said.

“No,” Chava protested. “They need you for the last one. Closure.”

“Bullshit. They need to see you in the lead role.”

“There you go again, assuming I’m going on the mission.”

“You pack more value per pound than I do,” Collum said, and strummed a minor 9th blues chord.

Later, in her dreams, Chava sang the whole Blind Faith album with Collum. She woke up to find her pillow wet with tears and a new item on her calendar: a summons to Base at 0800, with no explanation. She grabbed coffee but skipped breakfast and waited outside the admin hab for the ATV, breathing with the thrum of her embee and studying the prisms of sunlight sparkling on the dew. She felt a touch on her shoulder and turned to find Collum with Johann Meier.

“Do you know what this is about?” Chava asked, when they were settled and on their way.

“Johann and I have been briefed,” Collum said. “But we don’t want to prejudice you.”

Chava’s ears rang with her embee’s harmonics. Collum put his arm around her, and his warmth seeped into her core.

Cassandra greeted them outside the conference room door. She led the way into the room where Commander Worth and Captain Harrison were seated with Kapila Patel, both rumped and unshaven.

“Somebody needs to give these guys a break,” Collum muttered. “At least to change clothes and take a nap.”

Cassandra tapped Collum’s wrist. “Hush,” she said.

EvaLynn breezed through the door with a woman Chava recognized as Board Chair.

Commander Worth nodded to acknowledge their arrival. “Thanks for coming on such short notice,” he said. “The Board held a long meeting last night.”

The Board Chair turned to Chava with a weary half-smile. “Dr. Rosenberg, the Board accepts the mission administration’s unanimous recommendation to offer you the position of microbiologist for the mission to Epsilon Indi I.”

Chava’s embee sang a yes throughout her body. Collum squeezed her hand under the table.

On launch day, just before Chava boarded the shuttle to the Hub, Collum handed his guitar to her. She clutched it in her arms. As the shuttle ascended, Chava's vagus nerve told her she'd left part of her heart behind.

# Chapter 20

*“The desire to understand the world in terms of a naive and radical atomism, in which the elemental particles carry forever fixed properties independent of the history of shape of the universe, perpetuates an archaic view of the world. It suggests a nostalgia for an absolute point of view, a way of seeing the world that was lost when Newtonian concepts of space and time were overturned.”* From *The Life of the Cosmos*, by Lee Smolin

16 Adar, 5849

March 5, 2189

Earth Orbit, The Hub,

As Chava passed through the observation deck on her way to *La Canasta*, the view of Earth from the Hub made her weak in the knees. She didn't realize she'd stopped to stare until she felt a tap her on the shoulder.

“This isn't your last chance to see it,” Katsuo said.

The gentleness in his voice made Chava turn.

“Better get to the ship,” Katsuo said. “Brett Harbach runs a tight schedule, I hear.” His gaze was probing, and his eyes reflected Earth's inverted, blue, cloud-glazed arc.

Chava nodded her thanks, and dashed onboard to check into her quarters. She'd barely stowed her carry-on bag when she heard her name among a short list of officers called to the Bridge. She joined a queue of other baffled mates scrambling to find seats in the gallery.

Captain Harrison paced beside the command chair.

“Commander Worth called an unscheduled briefing,” she said in a voice husky with restrained frustration. “He'll address us when we're fully away.”



At the communication console, Leah tapped her temple. “Hub Control says we’re clear to depart,” she said.

Althea’s eyes were on navigator Owen Dishta as he rotated holographic controls to fine tune their course.

Chava strapped into a seat, joining Katsuo, Kapi and Johann as the Hub receded, glittering like a Ferris wheel tipped on its side. There should be fanfare, Chava thought, to mark the event, but there was only breathless stillness and the random tones of electronic equipment.

“Switching to a secure channel now to receive Commander Worth,” Leah said.

Katsuo glanced sideways at Chava. She read the unspoken question: What the hell would Commander Worth throw at us after it’s too late to say no?

Commander Worth’s image coalesced with Kapila Patel by his side. The commander launched into a spiel of thank yous and appreciations for the unprecedented moment in human history and the legacies the colonists would leave. He shifted his weight from one hip to the other and he kept looking down at notes on a soft tab.

Chava’s embee, dissonant from the transition to the ship’s environment, scrambled to settle on a frequency. (It would help if he would get to the point), Chava agreed.

“The purpose of this briefing is to give you an updated mission plan,” Commander Worth said. “Due to its sensitive nature, we kept it embargoed until the ship was safely away from Earth. Dr. Patel will explain.”

Kapila’s face brightened with excitement that made his disheveled appearance more comical than pitiable. “I’m happy to tell you, finally, that it will not take 24 years for the ships to travel 12 light years to EpsIndi.” He paused, and his face stretched into a smile. “It will take three months for the ships to reach a wormhole we created between the asteroid belt and Jupiter,” he said, and projected an image that flamed in Chava’s mind like a mandala.

“And then!” Kapila said, “Travel through the wormhole will be virtually instantaneous!”

Wormhole. Wormhole. Wormhole. The word resonated in every cell in Chava’s body. Her embee sang.

“All the work on stasis trials,” Kapila said, spreading his hands, “was mostly for our cover story! Crew will enter their stasis pods for safety, and, for lack of a better term, for a psychological buffer during the wormhole transit. The distal terminus of the wormhole opens into the Epsilon Indi solar system, and the ships will travel for another three months to the destination planet.”

Commander Worth said something about colonists’ morale, and keeping the wormhole’s existence classified until time to make the jump, but Chava’s fiery mental mandala consumed the Commander’s insincere words before she could make sense of his rationale.

“We’ll provide resources to help Drs. Kato, Meier and Rosenberg to prepare the colonists when the time comes,” Commander Worth said.

“With all due respect, Sir,” Althea said, “I don’t care how classified the information was, I’m the captain of this mission and this is not what I signed this crew up for.”

“After the shock wears off, we trust you’ll come around,” Commander Worth said. “The wormhole is a much safer way to get to Epsilon Indi than 24 years in stasis. I expect you to carry on with the mission.”

Althea stood perfectly still. “Understood,” she said, with a quiver in her voice.

The mandala reeled in Chava’s mind. Wormhole. Wormhole. Wormhole. And then she realized she’d known it all along.

## Part II

*“Eastern European synagogue chant evokes the reversibility of time in its most characteristic gesture, namely the ‘Phrygian’ or Freygisch descent from the flattened 2nd of the scale to the 1st degree, or tonic note. To hear this move in the Freygisch (Ahavah raba) mode as transformation of the directionality of time, we must hear it in the context of the tonality of Western music, with its clear sense of time’s forward motion. The Freygish flattened half-step, I will argue, functions as an ironic reversal of the most characteristic gesture in Western tonal music: the ascent of the sharpened 7th degree of the ordinary Western scale, or leading tone, to the tonic. This is the most characteristic pointer to the forward motion of time in Western music.*

*The tension evoked by the 7th tone of the scale is resolved in the final cadence on the tonic chord as the 7th tone moves by half-step up to the 8th, or tonic. We associate this resolution with the forward motion of time not only by habit, but through its functionality. The rising leading tone of Western music is the natural way to hear melodic direction. It is not the only way to hear melodic direction, to be sure, but it realizes the natural possibilities embodied in the relation of tonic and dominant, which nature gives us through the overtone series.*

*The flattened Freygisch half-step fulfills its religious purpose in Jewish music only when we hear it as a reversal of expectations learned from Western music.” -How Time’s Arrow and the Phrygian Half-Step Make Jewish Music Holy, by David Goldman:*

**T**he Singer gives Chava the *Ahavah Rabbah*, the song of Adonai's boundless love, with various melodies, but always using the Phrygian dominant scale. Chava is singing the reversal of expectations, the reversal of time, and the turning, always turning toward repentance and renewal.

# Chapter 21

*"I've got planets in my palms--there's a red smear in the sky/A star just exploded somewhere behind my eyes/In the dead of night, the city seems to break down into tribes/You stare at too much concrete and forget the earth's alive--excerpted from "Outside a Broken Phone Booth with Money in My Hands," by Bruce Cockburn, from "The Further Adventures of," 1978*

11 Sivan, 5950

May 27, 2189

Asteroid Belt

The wormhole had been visible for three days, at least to the crew of *La Canasta*. It was cloaked to other eyes.

Chava hadn't seen it. The mere thought of it made her woozy. She was still reeling from the view of Earth receding like a polished, turquoise stone tossed into the black lake of space, taking with it the truth of its trash heaps and denuded rain forests and desperate nursing mothers and starving hummingbirds and confused humpback whales and roiling rivers and baked deserts and choked oceans and dead-eyed fathers and ganja-smoking commune members and the ghosts of operas and blues festivals and bar mitzvahs and the outlines of pock-marked cities and the improbable bastions of reason where wild-eyed leaders spent the last of their petrodollars to send colonists to Epsilon Indi. Mars was too far away to see, but Chava imagined it hanging like a worn rubber ball lost on an abandoned playground. Between the ship and the wormhole, there was only the vast, stark, gritty loneliness of the asteroid belt.

Besides, there was the Shavuot celebration to prepare. Since the voyage began, Chava had marked Purim, Ash Wednesday, Passover and Easter and Vishnu, choosing elements to encourage everyone whether or not they held any religious traditions. For Shavuot, she filled the Commons with LED candles, placed hydroponic flowers in the canteens, and provided links to readings celebrating the courage of Ruth, as told in Hebrew scriptures.

She finished the last touches and returned to her station in the MedLab ring, relishing a rare moment of solitude, when Katsuo swept in.

“Are you still pretending to be busy?” he asked, taking two low-gravity strides toward a lab stool.

Chava pinged her office door. It opened with an emphatic swoosh. “I really have work to do,” she said. “It’s largely due to my diligence that you don’t have any patients in Sick Bay.”

Katsuo anchored his ankles on the rung of the stool and bowed in her direction. “And I thank you,” he said. “I just find it odd that you haven’t made the time to see the wormhole. There have been viewing parties on the observation deck. Raucous events at which you’ve been conspicuously absent. Captain Harrison even rolled her eyes when someone asked why you weren’t there.”

“Captain Harrison always rolls her eyes.”

“I’ll give you that. Still, I’d think you would be dying to see it. Even if it’s not what we signed up for!”

“Exactly,” Chava said.

“If you saw it...” Katsuo said, and his voice trailed off. “I expected to be wowed when Jupiter came into view, but the wormhole—I’m at a loss.”

Jacob Friedman shot into the Med lab. He glided to a workstation and activated its immersion console. Luminous symbols appeared in the space around his head.

“Friedman, have you seen the wormhole?” Katsuo said.

“Yes,” Jacob said. “I pissed my pants. And then I got back to work.”

Katsuo sighed. “I give up. I’m going to my quarters. I plan to open a bottle of wine and gaze out my viewport. All alone. You two make me wonder why the hell I left everything I knew and loved. But in case you change your mind and want to join me, I’ll set my door.”

“You have a view port?” Jacob said.

“Don’t you?” Katsuo said.

“You have wine?” Chava said.

“Don’t you?” Katsuo winked and then launched himself to the perimeter of the ring and ducked into the adjacent corridor.

“I don’t know what just happened, but judging from the awkwardness of this conversation, I’m pretty sure it doesn’t have much to do with me,” Jacob said. “I think you should follow him.”

“I don’t know what just happened either, but I’m not in the mood to try to figure out Katsuo.”

“What’s to figure? Just go have a glass of wine.”

“But the air quality reports won’t check themselves,”

Chava said.

“Then delegate,” Jacob said, pointing to himself.

Chava’s embee flooded her visual cortex with the flaming mandala and sang the Ahavah Rabbah. <You must be with this>, it said.

(Stop saying that), Chava grumbled. (I don’t know what you mean.)

<Go have wine>, her embee said with an adamant buzz.

Chava nudged her body into the corridor. If she returned to her own tiny bunk room instead of going to Katsuo’s quarters, Jacob would be none the wiser. But she had to face the wormhole at some point. She sighed and pushed off in Katsuo’s direction.

Chava hadn’t quite adapted to the ship’s new settings. Until its emergence from the asteroid belt, its gravity had been set at three quarter G to mimic EpsIndi. Now, all systems were

dampened to inertial levels in preparation for the jump through the wormhole. Chava felt absurdly graceful, like a little girl swimming underwater pretending to be a mermaid. Some of her tension ebbed by the time she reached Katsuo's door.

His link sensed her, opening his door. His back was turned to her, his head tilted toward his view port where arcs of light danced around his silhouette like aurora borealis.

Chava's embee roused and sang a version of the Ahavah Rabbah strong enough to tickle her eardrums and make her wonder if Katsuo could hear it. He didn't turn. She quickly refocused her gaze on his hands folded behind his back. Terms from anatomy class flashed in her memory: interossei, hypothenar, thenar, lumbrical. The Greek and Latin words for the muscle groups of the hand seemed elegant and apt.

"I think the silent slip-stream of inertia we're riding toward the wormhole is re-tuning me," Katsuo said, as he shut the viewport and finally turned. "I'll reopen it when you're ready to see it," he said. "If your embee will let you. Is your embee the reason you're avoiding it?" He offered his hand and led her to a narrow bench. They locked their feet on its frame and perched in awkward silence.

The whisper of the ventilation system was the only sound, and the stillness pressed on Chava's chest. She realized she was missing the white noise of the ship's propulsion system. A silent slip-stream indeed. She could feel the tug in her cells, like the moon's gravity on the tides. "It's not inertial," she said. Her hand fluttered to her mouth, too late. She hadn't intended to say that out loud.

"What?"

"The slip stream."

"It's not the best metaphor, but, hey, I'm not Collum Bruce," he said. He laughed, but it was too late to cover the slip.

So that's what this is about? Her shoulders slumped with the weight of it. She fought the urge to leave, but the tug at her



cells made her look up at him. They were both swimming in messy, mixed messages and unspoken expectations. The moment flowed in the slipstream that started with the big-bang and pulled along a single-celled organism until it gathered a colony of cooperating cellular systems that crawled out of the ocean and became conscious but nearly destroyed its home and then decided to colonize a new one and promised the slip stream it wouldn't make the same mistake!

Katsuo's eyes were wide and Chava realized she'd spoken aloud.

"I'm sorry," she said. "I don't know where that came from."

Katsuo leaned in, so close she could smell his clean skin and see the room lights reflected in his black eyes. "Don't apologize!" He nudged his body upward and tapped to open a wall panel. "I wasn't kidding about the wine," he said, retrieving a padded bag. "And I hope you like red. I can't drink white. For the same reason I don't like sake—it doesn't have enough flavor to mask the alcohol." He pulled two crystal goblets from the envelope. "Would you hold these while I open the bottle..."

He placed the goblets in her hands and then raised the wine bottle as if presenting a newborn baby. "It's just a Cabernet, nothing fancy," he said.

Chava watched the light split into colors on the goblets' facets and suffuse the wine as Katsuo poured it through a short tube. "The wine may not be fancy, but the goblets are exquisite," she said, admiring their domed covers and the raised spouts designed for sipping in low gravity.

"I had them commissioned," Katsuo said. "I was hoping I'd know the right moment to use them." He took a goblet from her hand. "But, first, a toast?"

"*L'Chaim*," Chava said. "Whatever that means, now."

"To life," Katsuo said. "Or, *Banzai*, whatever that means! To the next 10,000 years!"

Their goblets rang and they each took a long sip.

“You didn’t answer my question,” he said. “About your embee. What does it tell you about the wormhole?”

Chava’s embee resumed the Ahavah Rabbah. “It wants to see it through my eyes,” she said. “I think that’s why I’m afraid.”

“Drink a little more,” he said, and tilted his head toward the closed viewport. “The wormhole crushes me every time I look at it.”

She shivered. “I’ll never be ready. But show me anyway.”

Katsuo grinned and stepped up to open the port.

A pie-shaped slice of Jupiter vied for the view, but it was no match for the wormhole’s flaring orb. The corona danced like the mandala Chava’s embee had seared into her brain.

The room began to spin and she felt herself turning with it.

When the universe righted itself, Katsuo was gripping her wrist to steady her wineglass.

“I’m ok,” Chava said.

“I thought I lost you,” Katsuo said. “I’m sorry I made you look.”

“No, I had to. There’s too much at stake.”

Katsuo leaned in, his gaze intense. “What...I want to hear it. In your words.”

“Words!” Chava laughed. The wine was doing its job.

“Words are so...anemic. Look at those colors! Singing colors.”

Katsuo grinned and refreshed her goblet.

“This is our chance to get it right, Katsuo,” Chava said. “If we screw it up, we don’t deserve to exist. The universe should just reboot. Purge and start over.”

Katsuo steadied her hand again. “That’s harsh,” he said.

“But I think I agree. Don’t your people have a story about that? The Flood? Noah’s ark?”

“There’s usually a hard truth in such myths, don’t you think? The Hindus have Siva. There must be others.”

“My grandmother,” Katsuo said.

“What?” Chava strained to follow his non sequitur.

“I’m sure there are other myths but I can’t think of them now. When I do consider what’s at stake, I think of my grandmother’s life. I want to do something to make her hardship worth it. She had to leave Japan when the seas crept in, and she was forced to keep moving, raising her family in a kind of perpetual exile.”

“Now we’re the ones in exile,” Chava said. “We chose it, but we have become the diaspora.”

Chava was surprised to see a tear glinting on Katsuo’s cheek. She gathered it on her finger. Her first impulse was to taste it. “I wish I could do another Seder before we go through the wormhole. We have two elements right here,” she said. “The wine, and salt water. From tears. I don’t know why I thought of it now. Unless it was the wine.”

“What’s wine got to do with it?”

“It requires drinking at least four glasses.”

Katsuo laughed. “Then I’m in,” he said.

There wasn’t much free time until the wormhole transition, but Chava found it easy to spend much of it with Katsuo. He was smart and funny and didn’t make demands. Chava sometimes felt a twinge of longing for something more, but the sheer terror of what was ahead kept her from investing too much emotion.

Through Katsuo’s viewport, the wormhole was so close, they could view its aperture bulging with a fish-eye view of constellations on its other side. Chava never tired of watching the light arcing around its rim and throwing rainbow flares like a psychedelic rendering of a human ovum with its corona of follicle cells on fire.

After a day of final safety checks, Katsuo chattered beside her. She figured it was his way of dealing with nerves.

“I’m just feeling responsible for any potential injuries or casualties,” Katsuo said. “But I’m as satisfied as anyone could be with the safety checks. Even if the gel bath is overkill—sorry, poor choice of words—for protecting our bones and tissues from any unforeseen gravity stresses, its sensory deprivation will shield us from psychic trauma. I personally wouldn’t want to see the back of my own head, or experience the entire history of the universe in a single flash.”

“I comfort myself by knowing that if we’ve miscalculated our viability in the wormhole, at least we’ll go out the same way we entered the world. From a warm, wet womb to a tunnel that opens to the unknown,” Chava said.

“Sarcastic, but apt,” Katsuo laughed.

A haptic to their neural links jolted them out of the moment. Shailey announced, “30 minutes to wormhole approach.”

Chava glided to her quarters like a pebble skimming a lake. She took a final survey of the clean, curved geometry of her living space. Satisfied everything was secure, she shed her uniform and pulled on a one-piece wetsuit, tucking her hair into its snug hood.

Shailey spoke in a soothing alto voice through Chava’s link, instructing her to lie down in her berth. Chava complied and braced for total darkness. She took a few deep breaths as panels rose to enclose her.

(I’ve come to the end of my knowledge), she told her embee. (I prepared you to endure 3 Gs of acceleration when we launched. I prepared you to travel 250,000 kilometers per hour for the past 96 days. I can’t prepare you for the wormhole. Kapila Patel assured us that its construction avoids the lethal pitfalls of massive gravity, exotic matter and other factors beyond my expertise. But it’s all a lot of hand waving and smoke and mirrors to me.)

<You are still singing>, her embee said. <Listen to the song. The song of time.>

Chava strained to see light where there was none. The gel matched her body temperature. Unable to discern her own boundaries, she felt herself pulled outward, as large and convex as a planet. A rush of voices swirled in her head and the mandala erupted in her visual cortex. It expanded and then collapsed into a pinpoint of yearning for something exquisite and perfect that was snatched away before she could reach it.

Her embee sang the Ahavah Rabbah. <This, this, this>, it said.

The gel began to drain and Shailey told her to remove her helmet.

The yearning collapsed into a raw pain like a gaping hole in Chava's chest. She didn't want to move. She was limp and heavy and she was afraid if she looked down, she'd see her body seeping away with the gel.

When Chava's eyes adjusted, she sat up. A yellow strobe stained the pristine walls of her quarters. "I don't remember being told to expect a yellow alert," she said. "Shailey, what's our status?"

"Captain Harrison will announce status when systems check is complete," Shailey said.

"Bullshit, Shailey," Chava said, standing slowly while the gel dripped from her wetsuit.

"The ship and passengers are intact, Dr. Rosenberg. That's all I'm authorized to say. Stand by until the Captain gives new instructions."

Chava's link pinged with a private message from Katsuo.

"You ok?"

She refrained from describing her visceral sadness. "Shaky. I need a shower," she said. "You?"

"Shailey says there's no structural damage or casualties. I was thrilled until I opened my port. Chava, the wormhole is gone."

# Chapter 22

*“The history of the galaxy has got a little muddled, for a number of reasons: partly because those who are trying to keep track of it have got a little muddled, but also because some very muddling things have been happening anyway. One of the problems has to do with the speed of light and the difficulties involved in trying to exceed it. You can’t. Nothing travels faster than the speed of light with the possible exception of bad news, which obeys its own special laws.—”* From *Mostly Harmless*, by Douglas Adams--Ballantine Books--New York, 1992.

Captain Althea Harrison’s bulky frame eclipsed the doorway to her ready room. She braced the entrance with both elbows, like a hen spreading her wings, and surveyed her officers. With a deep sigh, she moved to the head of the table, adjusting her hijab.

“I feel like I’m the character in an old-timey cartoon who walks off a cliff but doesn’t start to fall until she looks down,” she said. She rolled her brown eyes sideways at Kapi. “Don’t lecture me about physics. I know this is more serious than the Observer Effect.” Althea raised her chin and addressed the room. “The last 24 hours have been harrowing, and I commend each and every one of you. Listen carefully, now. The absence of the wormhole—as terrifying as that is—does not absolve us from our duty. Yes, I know we are completely on our own and cut off from Earth. Kapi. Please tell us what we know.”

Kapi stood slowly. “Shailey and Owen have analyzed the red shift, the positions of the stars and planets and other factors,” she said and looked down at the flat surface of the table.

“According to our analysis, our fleet has emerged 500 years in the past.”

Chava’s chest fell like the air was sucked out of the room.

With downcast eyes, Helmsman Owen Dishta shifted in his chair.

“And that’s my best guess as to why the wormhole disappeared,” Kapi said. “The wormhole exists in what is now our future, and this terminus can’t exist at a time before it was created. What we can’t figure, is how we arrived in the past. The wormhole is a shortcut in the space-time continuum. We didn’t get here by traveling faster than light speed; so, our trip should not have experienced time distortions caused by General Relativity.”

Captain Harrison said, “I know this is more than we signed up for. But, remember, crew, we named our flagship *La Canasta*. In honor of the people on Earth who invested in a mission to put some of Earth’s precious eggs in a new basket. So let’s start problem solving. Owen and Shailey will assess the interception window for landing and adjust our trajectory. This ship, its cargo ships, our crew and our 274 colonists must press on.”

Johann raised his hand. “Captain, I have a question.”

“Just one?”

“What will Najaam Saeid do now?”

Althea sighed. “I briefed Captain Osman. Without an accessible market for asteroid mining, his crew will need to find a new purpose.”

Chava forced herself to endure the haptics of her neural-linked landing countdown for the remainder of the trip. Preparing for landing was almost as unbearable as waiting for a doctor to offer the prognosis for a disease that is usually terminal.

There was plenty of opportunity Chava to continue the grief work EvaLynn had prescribed. But it was impossible to locate what she was grieving. Her parents and friends had been killed in

the tornadoes six months ago, according to her body's clock. But, like everyone on the mission, she'd been jettisoned 500 years into the past, and had lost her whole world, because it didn't yet exist. EvaLynn warned her that the stages of grief aren't linear, but then, EvaLynn hadn't expected the wormhole to fuck with the space-time continuum. Where Chava existed now, denial was impossible, bargaining was pointless, and depression overlapped with sad acceptance tinged with anger at her *malak* for abandoning her, and now, at her embee, which languished in the ship's sterile closed systems.

She tried waking it by feeding it fermented lentils and sitting in the hydroponics lab, inhaling the scent of tomato vines and alfalfa sprouts, but instead of her embee's thrumming harmonics and gentle chatter, there was only the whisper of her own breath and the pulsing of her blood and heartbeat. For the first time since she was 12 years old, there was only herself. The normal internal chatter of her thoughts annoyed her. She prayed for her *malak* to return.

Katsuo didn't let her wallow in self-pity for long. Three days after the wormhole passage, as Chava was finishing the purity checks on the air filtration system and Katsuo was logging out of his records for the day, he surprised her with a gentle affirmation.

"Chava, thanks for the extra effort to maintain structure and celebrate holidays. You've got two full-time jobs." He gestured toward the microbiology lab. "I'm just pointing it out because I think you're under-appreciated."

"Johann's been doing the real work to keep our brains healthy," Chava said, and immediately regretted it. She hated it when people deflected sincere compliments, and she'd done just that to Katsuo.

"Johann's okay when it comes to dealing with fairy lights, reduced gravity, and basic stress," he said. "Not so helpful with interpersonal conflicts. I'm sure I wouldn't trust him to help me with intrusive thoughts."



“Why not?”

“I think he’d be the first one to get them,” Katsuo said with an impish grin. “You, on the other hand, taught me the universal value of Purim, Ash Wednesday, Passover, and Easter, and that’s in less than 90 days. But, now that I think of it, weren’t you and Johann planning an exercise for debriefing the wormhole experience?”

Chava’s face flushed. She’d completely forgotten. Or repressed it, because it was just another reminder that the wormhole was gone. And Johann hadn’t mentioned it. Shouldn’t Shailey have reminded her?

“Chava, it’s ok,” Katsuo said. “We’re all reeling. But we have each other’s back.”

“Katsuo,” she said. “I can’t sense my embee. And I should have expected this. The closed system is too sterile, and my embee can’t maintain critical mass.”

“No wonder you’re not yourself. Is it dead?”

What irony, Chava thought. I’m not myself when I’m only myself. “My embee said it’s waiting,” she said.

“Is there anything I can do?” Katsuo asked.

Chava shook her head. “You’ve already done enough,” she said.

She retreated to her quarters, grateful for its confined space. Staring at the curved ceiling, she listened to her breath and heartbeat until her eyelids drooped. She didn’t mind falling asleep to the pulsing of phantom lights caused by free moving subatomic particles from distant decaying stars that activated nerve cells in her visual cortex and danced in her head. Tonight, their cadence reminded her of a Celtic tune. Tapping her fingers on her thighs, she remembered Collum’s guitar was taking up precious space in one of her storage panels. She retrieved it, reading its grainy texture with her fingers, inhaling the scent of wood and varnish and metal, wondering why she hadn’t played it during the voyage. She plopped back down on her bed and strummed a wildly flat

chord. Her muscles remembered how to adjust the tuning keys and pluck each string and her eardrums remembered how to feel its vibration and judge the pitch, and these acts unleashed memories of the pull of full gravity, of the weight of humid air, of the smell of smoky campfires and waxy candles glowing at shul, of the sensual pleasure of other voices joining hers to build harmony. Harmony. Harmony reminded her of her embee. Light and song reminded her of her *malak*. Maybe she could sing away this aloneness. She picked a simple song. At first, her voice was tinny from disuse, but it warmed and grew stronger. I'm encouraged, she realized. In the literal sense of the word. I have the courage to help Johann. Katsuo is right.

She pinged Johann, but he didn't answer, so she left him a message. She thought of pinging Katsuo, but changed her mind. It would be better to take advantage of her calm, relaxed state and get some rest.

She awoke to find that Johann had returned her message while she slept, inviting her to meet with him. She hurried through breakfast, and then pushed her way through the curved white, gray and aqua-paneled rings connecting the MedLab to the admin section where Johann's office was tucked into an unobtrusive nook.

Johann's pale blue eyes were bloodshot and shadowed. He ran his palms over his cropped hair and gestured for Chava to sit.

"I'd like to be more helpful to you," Chava said.

"We're not too proud for your help," Johann said. His German accent was more pronounced than Chava remembered. His use of the plural pronoun didn't feel right. "We are all so lost," Johann said. "But we can find our way if we follow their instructions." He smiled and then gave a snuffling laugh.

"Oh, you found a protocol for this scenario?" Chava asked.

"Better than that," he said, and his face brightened. "I found our guides. They've been here all along. Waiting for us! And

they need your help, Chava. They asked for you to sing us through it.”

Chava’s stomach clenched. I need my embee. I need my *malak*. But she took a few deep breaths and looked more closely at Johann. “I know someone else who can help us,” she said. “Dr. Kato. Let’s go see him.”

Johann clapped his hands. “We admire Dr. Kato. Yes, let’s invite him to help.”

Chava’s mind raced as she guided Johann to Katsuo’s office. If Johann was compromised, how many others were? She recalled recommendations about caring for people suffering from sudden bereavement: don’t let them drive or operate heavy machinery. Have someone take over their responsibilities such as caring for children. Make sure their basic needs are met for food, shelter, safety and rest. Shit. Every person on the mission was suffering from acute bereavement. Who’s going to take care of whom? Who’s going to fly the ship? What if people become psychotic and act on their intrusive thoughts? She envisioned bodies flying out of air locks.

Katsuo took Johann into his office and shut the door.

Chava retreated to her workspace and didn’t see Katsuo again until late in the shift, when she turned to find him leaning against her door frame, staring at her.

“How long have you been standing there?” she asked.

“Just long enough.” He looked at his feet. “I just needed to see you. To clear my head.”

“I know you can’t tell me anything,” Chava said. “Unless Johanne has an infection.”

“I could authorize you as a heath tech and tell you everything,” Katsuo said.

“That’s not such a bad idea,” Chava said. “Who knows when we might need all hands on deck?”

“But you have enough work to do.”

“Yes, and I think I need to ramp up my auxiliary duties. I’ll ask Shailey to help me sort some profile-specific practices and therapies to support the crew and colonists’ mental health.”

Based on Shailey’s results, Chava solicited help from colonists and asked them to form small groups for spiritual practices, book studies, poetry reading, writers’ groups, dance classes, and exercise. Even Althea agreed to perform a few arias and contribute spiritual practices from Islam. Chava scheduled sessions twice each week for people to gather in their commons for singing, poetry, meditation and prayer.

After four weeks, at the end of a particularly long day, Chava accepted the invitation to rest in Katsuo’s arms.

“All that stuff you’re doing, it’s making a difference,” Katsuo said. “Only about five percent of the ships’ complement needs treatment now.”

“I don’t know,” Chava said. “Wasn’t everyone on the mission selected for traits like xenophilia, high tolerance to change and robust coping skills? Maybe people just needed some time to get over the shock.”

“Don’t you ever accept a compliment?”

“I just know my limitations. I’m no Johann. Is he any better?”

Katsuo shook his head. “Our psychiatrist is psychotic. I’m just treating the symptoms.”

“Who’s taking care of you?” Chava asked.

“I could turn that question back to you,” he said.

# Chapter 23

*“We can clearly see that Murphy’s law is both real, and unfairly applied to people colloquially known as ‘clumsy’. Robert Oppenheimer, in addition to some entirely forgettable work he did in physics, pioneered research into Murphy’s law by studying his own unfortunate condition. Bob’s affliction was first brought to the attention of his colleges when it was noticed that when he was in the lab, everyone’s muffins and buttered scones were 42% more likely to land upside-down. Even sandwiches with particularly binding peanut-butter were more likely to open on the way down. Oppenheimer, after he was politely asked not to work in the laboratories, made several startling discoveries such as the fact that Murphy’s Law is ‘recursive’, ‘pessimistically optimal’ and ‘robustly unfair’. The recursive nature of the Law is one of the more obvious. Oppenheimer was involved in one of the better examples of Murphy Recursion. During a celebration of his accomplishments and ‘clumsiness’, some of his fellow scientists constructed a lever attached to a prop chandelier, such that when Oppenheimer walked in and inevitably pulled the lever the chandelier would drop. However, they forgot to take into account the recursive nature of Murphy’s Law, and the lever didn’t work. Of course, had they tried to take Murphy Recursion into account, something else would have gone wrong.” From Ask a Mathematician/Ask a Physicist, April 1, 2013.*

Chava didn’t give much thought to the Epsilon Indi system’s dust cloud, until the ship’s activity switched to review and practice for approach and landing, when Helmsman Owen Dishta, who reveled in leading the exercises, gleefully explained that the dust cloud was denser and lumpier than the one in Earth’s solar system.

“The landing sequence will be tricky and I’ll be making adjustments in real time,” Owen said. “But don’t worry. Most of you will be safe in your deft little shuttle. And for the unlikely event we have to make an emergency landing, we’ll practice strapping in to the Aqua Zone in each ring,” he said, referring to the zone designed to become the ring section’s floor when rotation was no longer needed for gravity.

The route and process for boarding the shuttle was straightforward, although Chava lamented the absence of her embee, which, if functioning normally, would have augmented her memory and motor skills during the stress of landing. When it came time for the Science and Med Lab crew to practice the back-up procedure for the Aqua Zone, Katsuo was absent.

He pinged Chava a few hours later.

“I need you to run pathology and culture.” His voice was weary. “I did an emergency surgery for a ruptured appendix. The patient is Owen.”

“Shit,” Chava said.

“I hope we can nip any peritoneal infection in the bud,” Katsuo said. “We need him on his feet in time for the landing.”

“The usual suspects are nasty to treat,” Chava said. “I can do gram stains, and a rapid identification kit so you can start therapy for gram negative bacteria right away. Sensitivity results will take at least 72 hours.”

Shailey’s gene sequencing results yielded three separate gram-negative organisms—normal gut flora, but vicious outside their habitat. Owen’s condition deteriorated.

“Let’s try garden variety smart bacteria in the mix,” Chava said, lamenting her dormant embee, wishing for fresh sample, not the stale one in deep reserve.

At 71 hours, Captain Harrison called the officers to her ready room.

“Shailey says we’re entering the dust cloud ahead of schedule,” Althea said. “She’s firing reverse thrusters to slow our course, but I’ll have to do Owen’s job during the landing sequence. You all know how to prepare your sections for landing. Get to it.”

Chava’s stomach sank. The thought of being aboard the massive flagship during landing was terrifying, but she half-wished she was a crew member essential to the task so she could stay with Katsuo and Owen.

“Two hours until atmosphere,” Shailey announced. Non-essential crew and passengers, secure your work or personal space, suit up and board your assigned shuttle.”

Chava returned to her station. She tested the latches on her wall cabinets and refrigerator units and gave the room one last look before she closed the door, and crossed the lab ring to Sickbay just in time to see Katsuo restarting Owen’s IV line.

Katsuo looked up. “There’s nothing more you can do here,” he said. “Suit up and get to your shuttle!”

Chava couldn’t move.

“Damn it, Chava,” Katsuo said. “There’s only one emergency seat in this cubicle.”

A rap on the doorframe made them both turn.

“Friedman!” Chava said. “Why aren’t you boarding your shuttle?”

“Because I just checked the C & S results,” Jacob said. “The smart bacteria failed. I thought you might want to know, so you can jump start another option as soon as we land.”

Chava’s response was drowned in a red-alert klaxon. The strobe threw blood-red light in her eyes and Shailey announced, “Landing sequence emergency override. Board your shuttle immediately. The ship will enter the atmosphere in two minutes and artificial gravity will terminate. The ship will reach tilt altitude in 90 seconds. If you can’t get to your shuttle, strap into your ring’s AquaZone. One minute and fifty seconds to atmosphere. Artificial gravity will terminate in 70 seconds. Board or strap immediately.

Repeat: landing sequence emergency override due to an uncompensated anomaly in the dust cloud. Artificial gravity will terminate in 60 seconds.”

Chava calculated it would take at least that long to swim through the low-gravity environment to reach her extravehicular safety suit locker, suit up and get to her shuttle, with no margin for false turns or fumbling. Jacob’s wide eyes told her he’d reached the same conclusion.

“Sick Bay’s emergency seats?” he asked.

“In the patient cubicles,” Chava said. “Katuso has the code.” She engaged her link, but Shailey intercepted with a recorded message. “Interpersonal links inoperable during landing sequence emergency override.”

“Shailey, open two patient cubicles in Sick Bay,” Chava cried.

“Patient cubicles inaccessible during landing sequence emergency override,” Shailey’s prerecorded voice announced.

“No one figured we’d be stupid enough to be caught in the lab during an emergency landing,” Jacob said. “Instead of emergency seats in our Aqua Zone, we have work tables!”

At least the tables were the perfect height to crawl beneath.

“Like hamsters in a wheel,” Chava muttered. “‘Artificial gravity will terminate’. Why don’t we just say, we’ll be falling from the sky?”

Blood pulsing in Chava’s ears marked the final moments until Shailey began a 15-second countdown. “Fifteen, fourteen, thirteen...twelve... eleven...”

“Ten seconds until Skyfall,” Chava said, feeling tipsy like she’d drunk two glasses of wine.

No one spoke during the next dreadful moments while the ship plowed the planet’s atmosphere, its nose on fire.

“Twenty seconds to tilt,” Shailey said, at last.

The ship fired a burst of retro-jets to slow its free fall as its long cylinder tipped 90 degrees counterclockwise to stabilize for a



horizontal landing. The occupants of its ringed inner sections rode a clockwise descent engineered to orient a permanent floor with the ground. It felt like sitting in a Ferris wheel that had paused at its apex and then restarted to give its riders a thrill. Chava expected it to be jerky, like a Ferris wheel stopping to load new passengers, but the downward arc was smooth. She guessed it was over when G-forces pressed her to the floor.

“Firing landing retro-jets,” Shailey said. “90 seconds till touch down.”

“Now for the finale,” Chava said, trying not to think about everything that could go wrong. “I’ve forgotten most of the physics I learned in high school, but even a high school kid knows there’s no easy way to set down 1,000 tons of mass. Jacob, you look like a high school kid.”

“Really, Chava?” Jacob said. “Small talk? At this moment?”

“Some people say going through the wormhole changed them. Like a religious conversion. But I’m still an asshole,” Chava said, and felt like she was standing outside herself, analyzing her sudden compulsion to say out loud all the chatter that she usually confined to her head.

“Sixty seconds to touchdown,” Shailey said.

Jacob groaned. “I’m going to be sick. I take it back, Rosenberg. Keep talking.”

“Oy,” Chava said. “Who knew two Jews would be experiencing this moment together? *Mayn shveb-shif iz ful mit venger.*”

It took a few seconds for Jacob to respond. “Your hovercraft is full of eels?”

“Indeed it is. Monty Python was right: it is a most useful phrase.” Chava suspected Jacob had no clue who Monty Python was, but she found it comforting he understood some Yiddish.

The G-forces strengthened. Chava felt more than heard the power of the ship's antimatter propulsion system. "Listen to that," she said.

"I don't hear anything."

"That's because the eels are like shock absorbers. I bet you've never seen a shock absorber. I haven't. I'm from inner city Chicago. I always walked, or biked or took a LinkCab. Remind me where you're from, Jacob Friedman."

"Salt Lake City."

"I should have known," Chava said. "You have the eyes of a person who's been in exile."

Jacob whimpered.

"And then what happened?" Chava pressed.

"I got the hell out and went to college in Madison," Jacob said.

"So, it was only a flesh wound."

Time was palpable, as if their senses required something to fill the void.

"You scared? I sure as hell am," Chava said. "We practiced this in the simulator, but that was cheating. I knew I couldn't die in the simulator."

"You are an asshole, Chava. Maybe you should shut up."

"Too late, Friedman. You unlocked this can of worms. Everything alive in us, down to a cellular level, is screaming in rebellion against the death-wish physics of this descent," she said.

"I think I hate you. And the elephant that's sitting on my chest."

"Why is it always an elephant?" Chava asked. "Why not a hippo or a whale or even a frickin' manatee?"

"Maybe it's because the elephant is always in the room," Jacob said.

"I hope Shailey records your attempt at levity in this critical moment of human history," Chava said.

The final blast of retro-jets whispered through the ship's hull. Chava wasn't surprised to find her stomach in her throat and her ass bouncing off the floor. She was less prepared for her brain butting her cranium. She remembered reading a twentieth century astronaut's description of landing in a space capsule: it was like a train wreck followed by a car accident before falling off a bike.

Chava said, "Shit. Damn. Hell. We've landed. On Epsilon Fucking Indi I."

Jacob retched.

The red alert klaxon faded and the yellow alert strobe resumed. Chava crawled out from under the table and pulled herself up, and Jacob followed.

Chava listened for a sound from Sickbay, but her neural link pinged with protocol reminders, orders to the Bridge, passenger checks, and systems reports. Her inner ear wanted her to think she was still on the Ferris wheel, but her head knew the ship was on solid ground, intact, stretched on its side like a passenger train instead of a rocket.

Her cramped thighs complained but supported her as she crossed the curved floor space to Sickbay. She was halfway there when Shailey said, "Dr. Rosenberg, I've launched the environmental probes as ordered and alerted Dr. Jara to cover for you in the landing briefing so you can work on finding an effective therapy for Owen. The colonists have been instructed to return to the flagship from their shuttles."

"Thank you, Shailey," Chava said. "I know my gratitude is wasted on you, but the effort to express it is not wasted on me."

Katsuo had already opened the sickbay door. His face was white, his canted eyes wide. Chava leaned against his chest.

"Owen bounced," he said. His voice cracked. "But the restraints held."

"Friedman and I need to work on another sensitivity scan," Chava said. "Will you be okay?"

Katsuo nodded and tilted his head, listening to his link. “I’m getting casualty reports. Nothing critical so far. My staff is suiting up and heading over.”

When Katsuo was out of earshot, Jacob crossed his arms over his chest and said, “Are you just doing this for Katsuo’s sake? You know we don’t have any other options.”

“I do have one more strain of smart bacteria,” Chava said. The viability of her embee sample was questionable, however. “It won’t hurt to try,” she said.

Everything looked off-kilter in the newly oriented microbiology station. Chava fumbled with the latch on a refrigerated cabinet. “Damn thing is jammed,” she said. The metal screeched as she forced it open. She snaked her arm into the cavity, groping till her fingers found the small, foam-clad package. Extracting her arm without losing her grip on the package required her elbow and shoulder to bend at unnatural angles. The sharp lip of the door track broke the skin of her right forearm.

She winced as she handed Jacob the package. “Draw a new blood sample and inoculate it with this,” she said.

“Do you want gene sequencing while we wait for real time results?”

Chava hesitated. Friedman didn’t know about her embee. But what the hell. Chava could order Shailey to omit any reference to Chava’s DNA. “Of course,” she said.

“Ok. Get to the briefing,” Jacob said. “I can handle this.”

Chava started toward the Bridge, but the ringed corridor was already lined with dazed passengers heading to Sick Bay. “Excuse me. Pardon me,” she said, making her way past them, and cursing in Yiddish under her breath. “*Schlock. Kaka. Oy gevalt.*” She recognized the hydroponics coordinator, whose forehead bulged with a goose egg. “Hey, Manny,” she said. “You okay?”

Manny gave her a sheepish grin and a thumbs up.

In the captain's ready room, the air was stale. Graphics of casualty and damage reports floated above the table. Tense faces, shiny with sweat, turned when Chava took a seat.

"You're just in time, Dr. Rosenberg," Althea said through a swollen lower lip. "A few cracked eggs in the basket but no broken yolks." She rose to her feet, wincing. "I'm proud of you all. Training, common sense and effective systems kept our casualties to a minimum. So we're going to stick to the arrival protocol we trained for. We're compromised due to injured personnel, but it's nothing the cross training can't handle. So get to your stations. You are responsible for setting a tone of confidence and competency. Dismissed."

"Chava," Kapi whispered, pointing at a red stain on Chava's sleeve. "looks like you need some attention."

"It's just a scratch," Chava said.

"Then let's go to Sick Bay and patch it up," Kapi said. "Katsuo needs our help, anyway."

"There's nothing more surreal than trying to act normal when your mind is blown to hell," Chava said, following Kapi out into the corridor.

"We traveled more than 70 trillion miles and 500 years into the past and our first response is schlepping bandages," Kapi said.

"It will keep us occupied while we wait for the new samples from Shailey's environmental probes," Chava said.

Chava scanned the crowded Sick Bay for Katsuo, but saw only med techs providing care. Kapi asked one of the techs how she and Chava could help.

"I need a bazillion more hands," the tech said. "Over there, they just need superficial wound care and cold packs. Can you do that?" He lifted Chava's elbow. "Looks like you need to take care of yourself, first, Dr. Rosenberg," he said.

Chava covered the gash with a gauze pad and braced for the task of interacting with frightened and traumatized people.

Kapi more than compensated for Chava's reluctant bedside manner, providing a touch or a gentle word along with basic first aid.

Chava had just settled on the rhythm of the work when Shailey pinged.

"I have results on the microbiological samples," Shailey said. "With a margin for error plus or minus 10 years, I calculate they are 500 years ancestral to the ones we have on file. And like the ones on file, there's no evidence that they're pathogenic to humans. I've begun exposing some of the macro-biological samples to human microbiome. I recommend waiting 48 hours to reverify that our normal microbiome is nonlethal to life in this area and that our decontamination procedure was adequate."

"Agreed," Chava said.

"Owen has developed a small pulmonary embolism, and organ failure is inevitable in 36-72 hours if we can't halt the sepsis," Shailey said.

"Can you speed up the sensitivity results?"

"No, Dr. Rosenberg. We must wait for the culture. Gene sequencing was inconclusive."

"Forty-eight hours confined to the ship when a whole new world waits outside," Chava said. "Seems worse than six months in space."

"You can help Jacob and the med techs support Katsuo while he fights to keep Owen alive," Shailey said.

# Chapter 24

*“If the universe were cold and dead, if it contained no stars, there would be no living planets,”* From *The Life of the Cosmos* by Lee Smolin

Epsilon Indi I  
21 Av, 5949  
4 August, 2189  
EpsIndi Day 2

Eager to join the science team for the first trek outside the ship, Chava tapped her foot while Katsuo checked the dressing on her arm.

“Make sure it stays covered,” Katsuo said. “I don’t like you going out there.”

“You’ll be the first person I call if I’m attacked by a land shark,” Chava said.

At the airlock, Chava chose Jacob as her partner and nudged him in front of her to exit. “Go forth to the Promised Land, young Jew,” she said.

Jacob gripped the handrails and stepped down the ramp with exaggerated caution. “Don’t laugh at me, asshole,” he said.

“You can laugh at my ass when I come down,” Chava said.

“The day here is only 18 hours,” Kapi said. “Move it!” She muttered something in Tok Pisin.

Jacob stepped off the ladder and backed away, frowning and tugging his earlobe. “Do you hear that?”

Chava paused her descent. Her eardrums tickled. A sound like bells, a choir of ethereal voices, and water laughing over rocks

made her heart skip. Her embee was awake! But then she realized the sound was external.

She continued down the ladder, adjusting her billed cap and face shield to take in the domed turquoise sky where sheer lavender clouds flirted with a pale, salmon wafer of sun. Tickling her calves, narrow blades of burgundy grass rippled all the way to the low horizon, saved from uniformity by splashes of white flowers as big as dinner plates and bushes with bulbous, rust-colored trunks and willowy branches covered in delicate teal flowers.

Chava took a deep breath to fill her lungs. She'd eventually adjust to the thinner atmosphere, just as a vacationer acclimates to a mountain cabin, but for now, she'd need to pace herself.

The air smelled moist and spicy, like raisins. It settled on her cheeks; not clammy, but soft as powder and warm as an intimate touch she wasn't quite ready for.

The sights, smells, textures, and sounds were almost familiar, but not quite. Chava shook off a tingling shiver. "I've fallen into the uncanny valley," she said under her breath.

She still couldn't discern the source of the layered sounds.

"Stay in pairs," Kapi ordered. "Activate GPS. Turn on your body cameras and—all higher powers forbid—your stun guns. Don't touch anything. Have your epipen ready in case you have an allergic reaction. Record what you see and hear. We're due back at the ship in two hours."

A few paces out, Jacob asked, "If we can't touch anything, why are we out here?"

"You mean, besides the show of bravado?" Chava, said, though she actually felt small and vulnerable. She summoned enough bluster to answer Jacob's question. "We're here because of the hologenome theory of evolution, which posits that the holobiont—a host plus all of its symbiont microbiota—is the unit of selection in the evolution of plants and animals."



“I get it. But wouldn’t it be easier to say we need to get familiar with the macro biology of this planet to understand its microbiology?”

”Smart ass,” Chava said. “So start describing what you see and hear and smell. I’ll be quiet.” Chava listened to the thrumming savanna’s rising harmonics and held her breath when she heard a faint response from her embee.

<We awaken. We tune.>

Jacob stopped and turned his back. His shoulders drooped. “I gave up my girlfriend for this view,” he said. “I could never get her to understand that I wasn’t giving up on Earth. I hope we don’t fuck this up.”

She let his words hang in the fragrant, musical air, full of grief and shock and hope. After a moment, she raised her chin and filled her lungs. “*Barekhu et Adonai hamevorakh*,” she sang. By the third syllable, the harmonics of the savanna tuned to her mezzo soprano.

“Sing it again,” Jacob said in a thick voice.

“If you will do the response,” Chava said. “*Barekhu et Adonai hamevorakh*,”

Jacob answered. “*Baruch Adonai ha-mevorakh l’olam va-ed*.”

The white flowers turned toward them. A cloud of multi-colored, bright-winged insects rose in the air. The branches of the bush plants swayed.

“You must be the cantor of this synagogue,” Jacob said.

“At least for the savanna,” she said. “Maybe the other regions will prefer something else.”

They stood in silence. With each breath, something settled in Chava’s core, a peace incongruous with her alien surroundings.

Jacob took a deep, snuffling breath. “The air smells like my grandmother’s *lekach*,” he said. “I taste cinnamon, allspice, ginger, honey, oranges.”

“Make sure your recorder is on, and keep describing what you’re observing,” Chava said.

“About every 50 feet, I see a bushy tree about four meters tall with a trunk that looks like a rusty flower pot,” Jacob narrated. “With droopy branches and blooms like tiny blue-green lilacs. About every three feet, I see a plant with big, white blossoms. From a distance, its flower looks delicate, but up close, its petals are thick and waxy. It has a wide throat that gets narrower and redder on the inside. I’m not sure it has the same parts as an Earth flower, you know, the male and female things.”

“The pistil and stamens,” Chava said. “We hide our genitals. Flowers flaunt theirs.”

Jacob sniffed. “The flower smells like citrus. Not quite orange, not quite lemon. Almost grapefruit.” Jacob stooped and parted the grass with his gloved fingers. “The grass is thick and matted, with tunnels near its roots,” he said. “Several kinds of smaller plants grow in the tunnels. Some have flowers and some have seed heads like grain.”

They moved on.

“Is the humming getting louder?” Jacob asked.

Chava tucked her chin to listen. “I can hear different voices.” She tapped her sternum. “I feel it, here.”

The ground sloped downward and then leveled. The air smelled mustier, with hints of pepper, cinnamon and cloves mingling with the citrus milieu. Pockets of water pooled in the grass and the bushes grew in thick clusters, with woody knobs like cypress knees radiating from their trunks.

Chava’s mind processed the shapes of bushes and root knobs, but new forms and colors and sounds fell into her brain with no place to land. The urge to stare fought with the reflex to turn away. She took a deep breath and steeled her gaze on pastel fingers tickling the air atop corkscrew stems a meter tall; on undulating mats of lavender ruffles; a grove of slender, yellow stalks as tall as saplings, topped with delicate blue rosettes; patches

of fleshy, inverted bells wearing lace skirts; clusters of crimson toadstools fit for an elephant, dotted with pursing pink-lipped orifices: and all of them singing, tinkling, babbling or buzzing.

“Mushrooms?” Jacob breathed.

<We hear the Singer.> her embee said.

The sound pulled Chava into the spin of the planet: she tripped on the submerged knob of root and fell facedown at the base of the bush. Wet muck filled her nostrils. The spice smell was rich and cloying.

“Don’t move,” Jacob said. “There’s an animal a few feet from your head.”

Chava kept her head low and turned it slowly so she could breathe. She saw a four-legged creature the size of a house cat creeping toward her. “Don’t reach for your stunner,” she whispered.

The animal stopped to sit on its haunches. Jagged, iridescent stripes flowed under its smooth skin in silver, purple and green. Its tail coiled over an arched back. Its long oval head was wide in the back, suggesting a large brain, and its face tapered to a delicate, rounded snout with fluttering nostrils and a small curved mouth. It flicked long, upright ears and stared at Chava with enormous amber eyes.

“Churrr, churrr, churrr,” the animal trilled, extending its neck and uncurling its body to inch its nose closer to Chava. Its nose brushed her face, soft as a flower petal. Its hot breath smelled like the soil. “Churrr, churrr, churrr,” it thrummed, and sniffed its way down Chava’s neck to her shoulder and arm. It froze and stopped churring when it reached her right sleeve where the gauze pad protected her wound.

Chava barely felt the tiny teeth sinking into her skin.

The creature bounded away, disappearing into the base of the bush.

Chava's arm tingled. A rush of pleasure flowed to her brain and her body fell away. She heard Jacob calling her name, but just didn't care.

## Chapter 25

**T**he Singer chides us. You chose this, the Singer says. You chose this human brain for its quantum potential, with its exquisite network, and this human body that knows deep within each cell the song and scale of the universe. It doesn't know that it knows. You will teach it.

Epsilon Indi I  
24 Av, 5949  
7 August, 2189  
EpsIndi Day 3

Chava roused as Shailey spoke softly through her neural link.

"I'm monitoring your biometrics, Chava," Shailey said. "You are in Sick Bay and your condition is stable."

Chava stretched under a cool, smooth, microfiber sheet that touched her thighs and torso, jolting her with the realization she was naked except for standard-issue underwear. Her embee's harmonics surged.

"Your adrenaline spike has alerted Katsuo," Shailey said, and the breast of a white jumpsuit came into view.

Katsuo's brows nearly met in the middle of his forehead behind a clear face shield. He gripped Chava's bed rail with both hands. "Hey," he said, leaning closer to check her pupils. "How do you feel? Even though, so far, you haven't shown an inflammatory response or immune reaction, I have you in quarantine. Just be

safe.” He glanced at the monitor. “In fact, your metrics are...perfect.”

He’s nervous, Chava told her embee. He always chatters when he’s nervous.

It answered with singing harmonics that pulsed in her skin, her ears, her brain.

Katsuo lifted Chava’s arm.

Green and blue swirls flowed under her epidermis.

(What the hell?) she asked her embee.

<We have new sisters>, it said, with a trilling layer she’d never heard before.

“Shailey?” Chava whimpered. “You said I’m stable!”

“Your biometrics are perfect, as Dr. Kato reported.”

“Check your arm where you cut it yesterday,” Katsuo said.

Chava fingered smooth skin where a scab should have been.

“The bite marks were almost closed by the time we got to you,” Katsuo said.

“Did you catch...whatever it was?”

Katsuo shook his head. “We searched, but there was no sign of it. Seriously, Chava, how do you feel?”

“Woozy. Hungry.”

“Can you sit up?” Katsuo asked.

Chava braced on her elbows until a moment of light-headedness passed, as sensory input normally below her threshold rushed at her: the ventilation system whispering over the hum of the new orchestra in her body, the whir of lab equipment, the faint drumming of Katsuo’s heartbeat, bland scents of the cleansing compounds he’d used to wash his lab coat and take his shower mixed with the salty musk of his nervous perspiration. She looked down at his white knuckles where his hands clutched the rail. Each tiny dark hair on his hands stood out in contrast to his skin. She closed her eyes to dampen the stimuli.

Katsuo helped her sit up and swing her legs over the edge of the bed.

She stared at her kaleidoscope thighs. “Does Friedman have them, too?” she asked.

“No,” Katsuo said. “I was hoping to consult with my microbiology director about precautions, but she’s been asleep for 10 hours.”

“Holy shit,” Chava said. “How’s Owen?”

Shailey answered. “Owen will be in organ failure within 12 hours,” she said.

“The sensitivity results?” Chava asked.

Katsuo shook his head. “The smart bacteria weren’t viable.”

Chava’s embee leaked a rush of grief, followed by a corrective bolus of hormones to shield her from it. Somewhere in the cacophony of physical sensations, her bladder’s fullness clamored for priority. “I need to pee,” she said.

Katsuo guided her to the toilet, where she was relieved to piss nothing but a stream of warm, yellow, fresh-smelling urine. The paisley-swirled thighs she saw straddling the commode seemed to belong to someone else, but she managed to stand and pull on her jumpsuit. Its fabric smelled like the cleansing compound and she felt every fiber of its texture. She crept to the Lab, holding onto furniture to steady herself, too embarrassed to call out to Katsuo and Jacob, who were already busy at the immersion console.

Jacob gaped when he saw her. “I’m trying not to freak out,” he said. “I saw them—the things—in your blood sample. Shailey’s still working on it.”

The immersion graphics activated.

“I still don’t have a classification for the molecular structure of the foreign genetic material,” Shailey said. “You’ll recall from previous samples that it’s analogous to DNA. However, this sample has DNA, related to the human microbiome in its

matrix, with some traces of Chava's. I haven't called in Dr. Jara. I surmised that Chava should see it first."

"Take it easy, Shailey," Katsuo said. "You're talking about Chava. She is the patient." He pulled a chair closer so Chava could sit.

<We found the life codes and changed them>, her embee said. <We are better together.>

Chava hugged her chest and rocked in the chair. (I need Dr. Roca), she told the new chorus.

Katsuo knelt and looked into her eyes.

"I'm talking to them," she said, forcing herself to hold his gaze as he checked her neurological status

"Your embee?" he asked.

"It's still there," she said. "Different. Stronger."

A monitor shrilled with an alarm and Shailey announced, "Owen's blood pressure is falling."

Chava's skin tingled and her ears rang. Her microbiome's surging signal crackled in her brain like static and she jumped up, covering her ears. Katsuo held her shoulders, and she coaxed herself to breathe until the dissonance resolved, forming words, as if her embee had wrestled with the alien microbes to settle on a way to communicate.

<We can help>, the enhanced embee said. <We are in your blood.>

Chava dropped her hands and faced Katsuo.

"We need to culture Owen's blood with mine," she said.

"I hear you," Katsuo said in a thick voice. "But even if it works, I can't inoculate Owen with those things. I don't know the risks."

"If you do nothing, Owen's risk of death is 99.9999 percent," Shailey said.

Katsuo and Chava locked eyes for several seconds. "Ok then," he said. "Friedman, draw Chava's blood and get a new sample from Owen. It's going to be a long night."

“Dr. Kato,” Shailey said. “I’m nearly 100% certain the organisms aren’t airborne. If you’re more comfortable, you can remove your personal protective equipment.”

Katsuo took off his face shield. “Chava, I’ll set up a cot for you in my office and get some dinner for us.”

Chava appreciated the view from Katsuo’s office port. After months of stars and unfathomable blackness, the rolling grass and sky and clouds gave her a boundary she sorely needed.

The orange sun reflected in Katsuo’s eyes as if it had gathered all his shock, grief, awe and confusion into one pinpoint. His gaze flitted between her face and the view port as they sipped more of his precious red wine and nibbled at rehydrated couscous and tofu.

“You missed the ironic hyper-application of protocol while you were sleeping,” Katsuo said. “The captain is carrying on as if \_\_\_”

“As if our lives depended on it?”

“I know, what else can she do? She’s begun the ships’ conversion to temporary habitats and command centers. There’s a schedule up for communal meals, and as soon as you’re ready, Althea wants you and Kapi and Owen to judge if there’s anything we can get into the ground before fall. As my grandmother would say, Captain Harrison is coping by managing the flow of the water over the dam. *Obasan* knew. About water and dams. Just like your grandparents in New York before...and...” He looked out the viewport. “Have I lost you, Chava?” He lowered his head.

“I’m right here,” she said.

“Do you feel them moving,” he asked, raising his head to look at her.

“They tingle, or buzz, or vibrate. It’s hard to describe. Shailey believes they’re symbiotic. She even coined a name for them. Symbionts.”



“Symbionts. Sounds like a twentieth century sci fi movie. And you look like...remember that classic science fiction story, *The Illustrated Man*?”

Chava nodded. “I’m going to scare the shit out of people.”

“There’s too much strangeness flowing over the dam,”

Katsuo said. “We still have five percent of the colonists sequestered for mental health symptoms and that’s just the serious ones. We had to devote a whole ring section to house them. We call it Number Nine. I know, it’s random. That’s the point. Did you know the mushrooms sing? And so does the night sky. The science team found giant birds that feed on the white flowers’ nectar. Kapi says they aren’t true birds, but they aren’t mammals, either. They’re warm blooded and hairless. They have long, thin beaks, like hummingbirds, and huge wings, like pterodactyls. At night, they gather and spread their wings to shelter their...their little ones,” Katsuo rambled.

“I’m still here, Katsuo,” she said.

His eyes refocused. He looked at her and then turned away.

“When are we going to tell the Captain?”

“Let’s wait and see if we can help Owen,” Chava said.

# Chapter 26

*“To watch the sun sink behind a flower-clad hill. To wander on in a huge forest without thought of return. To stand upon the shore and gaze after a boat that disappears behind distant islands. To contemplate the flight of wild geese seen and lost among the clouds...”* by Zeami Motokiyo

Twelve hours after Katsuo injected Owen with Chava’s shimmering plasma, Chava waited in his office while he checked the results. She figured four days had passed on EpsIndi since landing. Shailey’s clock’s had lost their reference to Earth time, and Chava didn’t have the mental energy to convert EpsIndi days to the Gregorian Calendar, much less the Hebrew Calendar, so she tried to rest her thoughts by watching through the view port as a crew of colonists erected a ramp on a domicile across the central area dubbed The Commons, where the dismantled ring sections from all three ships had been towed into place to form a large circle. The activity had flattened the purple grass, but instead of looking worn, the grass formed a resilient mat.

It was midday, the time when the dust cloud threw its shimmering cloak across the sun. A worker looked up, pointing and shaking his head at the alien phenomenon that twice daily turned the sky into a spinning carousel of colors. Chava shivered and rubbed her arms, where the swirling patterns marked her as alien, too.

Katsuo pinged.

Chava held her breath.

Katsuo’s hand appeared on the door frame as the rest of him skidded into view and braked to a full stop. “Owen’s awake, and his vitals are stable,” he said. “Chava, he has them, too.” He

stared at her and then looked down. “They’re so strange. And beautiful.”

“What’s strange and beautiful,” Althea Harrison said breezily as she entered the office. But when she saw the kaleidoscope of Chava’s skin, her ebony face turned chalky and her eyes rolled back.

“Help me, Chava,” Katsuo said, jumping up. “I don’t think I could catch her if she faints.”

Chava gripped Althea’s shoulders.

“Take a deep breath, Sir,” Katsuo said.

Althea breathed. She shook herself like a dog shedding water as her eyes refocused.

“Allah, be merciful,” she said. “Your report said Chava was quarantined, but—”

“That’s right,” Katsuo said. “So, with all do respect, sir, what are you doing here?”

“I came to get a progress report on Chava and Owen. I had a feeling there was more to your report...”

Katsuo looked at Chava for a long time. “We were trying to gather more information before you gave you a full run down,” he said. “And then we had to save Owen’s life,” he said.

Althea’s eyes widened and Chava feared she’d revert to shock. “What did you do?”

“We inoculated him with the symbionts,” Katsuo said.

Althea took a step back. “What did you call them?”

“Symbionts,” Katsuo said. “It’s done. It worked.”

“That’s not the point,” Althea said. “Aren’t there protocols for experimental therapy?”

“I don’t have the luxury of experimental trial protocols here,” Katsuo said. “You’re just going to have to trust my judgment. With all due respect, Sir.”

“We already have too many people incapacitated by shock, and the ones we have left aren’t playing well with Najaam Saeid,” Althea said. “I need you and Chava and Owen at full function.”

She tapped her temple and sighed. “Speaking of the devil, I’m getting a ping from Berat—Captain Osmon,” she said. “It’s only the fifth one today. I need to deal with Najaam Saeid, but you’re not off the hook. But you look like shit. Take the afternoon off and get some rest.” She turned to leave, grimacing.

“Captain, are you limping?” Katsuo asked.

“I dropped some PVC pipes on my foot,” Althea said. “Just a bruise. Nothing’s broken. Now, get out here. Rest up. Celebrate Owen’s recovery.”

Katsuo brought the celebration to Chava. He scented his office with jasmine. Real candles cast trembling light, making his shadow bloom large on the wall. Chava expected a few glasses of wine, but not the tender kisses that made her skin ache to touch his. Her strengthened embee enhanced every sensation. She raised her hand to Katsuo’s face. “Katsuo,” she said, “I don’t know what we’re doing.”

He covered her hand with his. “I took the contraceptive injection,” he said.

“That’s not what worries me.”

“I know.” He shifted his hand to trace the patterns flowing on her forehead. “Chava, I don’t want you to be alone in this,” he said.

“I’m not alone,” Chava said. “Owen—”

“But Owen doesn’t...”

“Owen doesn’t what?”

“Owen doesn’t love you,” Katsuo said.

Chava’s heart opened. “Say it again,” she said.

“Say what? Owen doesn’t love you?” His deflecting words fell on Chava like cold water.

Damn him, Chava thought. We’re acting like stupid teenagers. “You should go,” she said.

Katsuo looked confused. “I’m getting a ping,” he said. His eyes widened. “We have a situation. I need all hands on deck. In Number Nine.”

“I can’t go to Number Nine. I’ll make things worse.”

He shook his head. “Things can’t get worse.”

Chava took a deep breath and stepped out into the powder-damp air with Katsuo. He broke into a run across the Commons toward Number Nine.

The edge of the dust cloud already laced the horizon with its sparkling mantle, and Number Nine’s hull glowed with pearlescent colors under the canopy of stars.

It’s so strange, Chava thought. So much light. How does it make the hull look iridescent?

Katsuo pinged the entrance and stepped onto the ramp. It sagged under his weight. He lunged forward to grab the doorframe and regain his balance, but pulled his hands away, grimacing. “Something sticky,” he muttered.

Chava followed cautiously. Katsuo wasn’t heavy, and the ramp shouldn’t have buckled. She planted one foot. The ramp held, but it felt more like plastic than metal alloy.

Katsuo was already inside. Chava followed, and stepped into the heavy silence. She recognized Celia Farner, one of the chief med techs.

Celia spoke quietly, briefing Katsuo through their neural links.

Katsuo braced himself against the interior wall and sighed. “Let’s go take care of it,” he said. “Chava, the medicine tech is loading some sedatives to get the patients through the night. I authorize you to help dispense them. Celia and I will take the body to the med lab for an autopsy.”

“Body?”

“I’ll explain later.” Katsuo removed his jacket and gave it to Chava. “Put the hood up. And grab an isolation mask.”

Chava complied, and hurried to the work center, where she found a young man loading hypodermic syringes. He backed away from her and then took a deep breath. “Sorry, Dr. Rosenberg. I was warned. But...”

“No need to apologize,” Chava said. “I forgot your name.”

“Tommy Dishta,” he said. “Owen’s brother.”

“Oh,” Chava said, and saw the sibling resemblance.

“I heard Owen has them, too,” Tommy said.

“He does.”

Tommy squinted. “They’re kind of pretty.” His hand trembled as he picked up a syringe. “Give me a minute. This has not been my best couple of hours.”

A series of thuds and muffled shouts punctuated the comment.

“Somebody’s getting restless,” Tommy said. “Here’s the plan: you steer the cart and wait outside each cubicle while I go in.”

Chava nodded and followed him into the curved corridor.

“This isn’t how we want to treat people,” he said. “But without Johann, we don’t have much choice.”

“How’s Johann?” Chava asked.

Tommy halted. “You don’t know?”

The realization stole over Chava like falling into ice water. She was grateful for the numbness that followed, as she pushed the cart from room to room. Each door leaked a secret in the form of a wrenching sob, an ironic burst of laughter, a conspiratorial whisper, or an accusatory shout.

Almost two hours later, Tommy finished. “You should get out of here,” he said. “Send Celia back if you can. I hate being alone here.”

“I will,” Chava said. She pinged the exit. The door panel opened half-way, and then stuck. Chava wriggled through the gap and peered at the outside hull. The shimmering colors were brighter than before. This is not reflected light, she realized. She

touched the surface; it was tacky and pliant. Her symbionts clamored in response, and she held her hand in place until the halting impression became more clear.

<Life. Alive. Living>, they said.

Chava withdrew her hand, confused, but not alarmed. She stepped down the ramp; it moved under her weight like a springy rope bridge. Each footfall created a brief color burst.

Across the commons, the entire ring of habitats blushed with soft, liquid pastel lights.

Chava pinged the MedLab hab' door and was relieved when it opened all the way. She heard muffled voices and saw a light under the surgery cubicle's door panel. That's where Katsuo and Celia are doing the autopsy, she figured. Autopsy. Such an impersonal word for virtually dissecting someone who was living and breathing an hour ago. Someone human. At least they didn't need to cut him open like in the old days.

The area's only illumination came from equipment lights, so Chava waited for her eyes to adjust and then headed to her station. I should start a sample of that stuff out there, she decided. And tell Kapi. And someone should make sure the Captain knows. People are going to freak out when they leave their habs in the morning.

Her symbionts queried, <Why fear? Why fear goodness?>

(What goodness? This is strangeness!) Chava answered.

(So much strangeness for us.) Poor Althea. Now this in the middle of the Johann incident.

<Your leader is strong>, her symbionts said. <Tell her about the goodness.>

Chava took a deep breath and pinged Althea and Kapi. Neither responded, so Chava left a detailed message.

She grabbed a sample kit and peered across the lab to Sick Bay. A strip of light still showed under the surgery door. From the opposite arc of Sick Bay, Chava heard a faint cough. Owen was awake. Chava sensed the faint hum of his symbionts.

She tiptoed to his cubicle, hesitated, and then rapped softly on the door panel instead of pinging. "Owen, it's Dr. Rosenberg," she said.

After a moment, the panel slid open. The only light in the cubicle glowed from the view port behind Owen, casting him in silhouette. His symbionts sparkled in silver and blue spirals around his arms, fingers and neck. They formed a nautilus on his forehead and smaller curls like the crests of waves in the hollows of his cheeks. He came closer to Chava. "May I touch yours?"

Owen was about Chava's height, squarely built. Even his face had square planes, with a strong brow ridge, high cheekbones and a wide chin. Chava nodded her assent and he took her chin gently in his thick hand and turned her head.

"Your patterns are different," he said.

"I'm sorry, you had no choice in this," Chava said.

"I'm alive," he said. "Maybe more alive than before. Do you feel it?"

"I do," Chava said.

"They sing to me," he said. "I can fit the music to the words of my people's chants and prayers." He looked toward the view port again. "I need to be out there."

"I think you should wait for Dr. Kato to release you."

He drew his black brows together. "I am waiting," he said, and Chava sensed a deeper meaning that she couldn't quite fathom. "Do you see the glow in the hulls?"

Chava nodded.

"Did your...things..."

"We call them symbionts," Chava said.

Owen looked away and shook his head. "They have a name. I can't pronounce it. They tell me things, but not in words. Impressions. Pictures. Feelings. Did they tell you they're making our structures alive? But how? Are they eating the metal? Changing it to something biological? What kind of life is it?"



<Yes yes yes!> Chava's symbionts sang, in tune with Owen's.

He smiled. "I hear it," he said.

Chava stepped outside the Med Lab and took separate swabs of its hull and ramp. She processed them for Shailey and instructed Shailey to scan gross anatomy, DNA, chemical and molecular structure. "You can give me the results in the morning," she said. "I'm going to try to rest now."

Chava retreated to her cot in Katsuo's office. The space felt cold and strange, full of sharp angles and intimidating equipment. She was tempted to sneak out and run to her own bunk room. After all, the hour was late, and no one would be likely to see her. Besides, she couldn't hide forever.

But just then, Katsuo stepped in, pale and weary.

"I can't talk about it," he said, leaning against the wall, looking at the floor. "Chava, I don't want to be alone tonight."

Chava tensed, recalling the angst of their earlier encounter—had it really been just a few hours ago? But her symbionts released a surge of dopamine and oxytocin. "Are you asking me to stay with you?"

He nodded. "Sleep with me. And I mean...sleep."

Chava gathered her things and walked with him back out into the spangled night.

Katsuo hesitated outside his quarters. "I should issue a safety alert before morning about the unstable ramps and the condition of the hulls," he said. "But what would I say?" He pinged the door. "I'm so tired."

"I already briefed Althea," Chava said. "And Kapi."

A shadow passed overhead. Katsuo looked up, pointing. "Dactyl," he said. "Big one."

Chava turned around in time to see the winged shape slide over the stars. "I wonder what it's doing here," she said.

“Let’s get inside,” Katsuo said, “You go first. Using the facilities, I mean.”

Althea pinged while Chava was in Katsuo’s bathroom.

“I got your message,” Althea said. “What precautions do you recommend?”

“Shailey is analyzing samples. Until we know more, all we can do is avoid prolonged contact with the surfaces. And take care using equipment that might fail. In case the doors malfunction, maybe people should leave them ajar.”

“I’ll send a colony-wide alert.”

Chava hurried through her bedtime routine. She padded out of the bathroom wearing a sleeveless sleep shirt and soft shorts. She found Katsuo drowsing and slumped on his bench. He straightened when he saw her. She blushed under his frank gaze.

He grabbed some things from a cubby near the bed. “Same outfit,” he said with a weary half-smile, referring to the gray bundle in his hands.

Just as he ducked into the bathroom, Althea’s alert hit their links. Chava listened and tried to imagine the colonists’ reactions.

<It is goodness>, her symbionts said again, and Chava wondered if they were inducing the calmness she felt.

When Katsuo returned, they stood awkwardly beside the bunk. Chava fought the urge to giggle; Katsuo’s eyes were too haunted and sad.

<Touch>, her symbionts said. <His skin needs touch.>

“Would a back rub help you relax?” Chava offered.

“There’s probably some lotion around here somewhere,” he said, and Chava took that as a yes. He rummaged in the bedside drawer and found a tiny packet. “It’s mission-issue,” he said. “Better than nothing.”

While Katsuo took off his shirt, Chava turned back the covers. Katsuo lay prone and tucked his arms under the pillow.

Chava knelt beside the bunk. She warmed the lotion between her palms and pressed her hands to his spine. The height of the bed was all wrong and she couldn't find an effective angle, so she climbed up and straddled him. He smiled and closed his eyes. She slid her hands along the groove of his backbone, compressing the firm muscles beneath his smooth skin.

<Use all senses>, the symbiont chorus said.

(I am), she told them. (But the sight of him... If I look at him, I'm done.) Too late: she gazed at the high, round cheekbones that softened the angles of his face, at the straight, black hair stretching nearly to his shoulders, and his naked torso tapering to narrow hips.

The lotion's minty fragrance drew her back to the task. It blended with the scent of Katsuo's skin and Chava breathed deeply of it. It filled her with deep satisfaction. Chava hugged his ribs with her thighs. He groaned involuntarily as her hands worked. "How did you know I needed that?"

Chava didn't answer and he didn't seem to care.

Katsuo turned to his side and pulled her close, burying his nose in her hair and murmuring, "You fit here."

Chava wasn't sure if he meant she fit in his arms or in the cramped space between him and the wall. He was asleep before she could ask.

Sometime during the short EpsIndi night, Chava dreamed Bree was sitting on the bed with her and Katsuo. All she could see of Bree was her red lips and bright, dangly earrings.

"Is that all that's left of you?" Chava asked.

"Hell, no," Bree said. "There are bits of me everywhere. They go where they're needed. So, what are you waiting for?"

"Am I waiting?"

"Don't tell me you're not ready for Katsuo. Sure, you have father issues and unfinished grief and a lot of shit in your past, but let me tell you, if it's not one thing, it's another."

"I told you, my *tikkun olam* isn't a guy."

“But maybe his *tikkun olam* is you.”

An earring flashed in the murky light and Bree was gone.

# Chapter 27

*“Sometimes the wind comes out of nowhere and/Knocks you sideways and look--see my tears/They fill the whole night sky./ The whole night sky—” The Whole Night Sky,*” by Bruce Cockburn, from *The Charity of Night*.

Chava awoke to an aroma like orange glazed cinnamon rolls as fresh morning air seeped through the vent. Pink sunlight filtered through the viewport shade. The bunk was not designed for co-sleeping and Chava’s nose was pressed to the wall. Katsuo’s chin bobbed against the top of her head as he mumbled something and squirmed during a REM cycle, flopping his arm across her waist. The limp, dead weight of it was somehow endearing. She didn’t want to move, but she really had to pee.

A tap, tap, tap from outside woke Katsuo and solved her problem. “Berat. Give it a rest, man,” Katsuo said in a half-whisper.

Chava smiled. “Berat? How do you know it’s Captain Osmon?”

“He never stops,” Katsuo said, stroking Chava’s hip and then pulling away to stretch. “That’s why Althea put him in charge.” He sat up and ran his fingers through disheveled hair.

“In charge of what?”

“The domicile conversion.”

So what else am I missing because I can’t be seen at the officer briefings? Chava wondered, but it was too early to open that can of worms.

“Berat was driving her crazy,” Katsuo said. “She had to give him something to do. He won’t rest until everything’s set up. He was obsessed even before the hulls started to glow in the dark and the ramps turned to rubber.”

“That doesn’t give him an excuse to disobey the captain’s order to avoid touching it,” Chava said.

“Don’t forget, he’s a captain in his own right,” Katsuo said.

“Yes, but he agreed to the terms of this mission.”

“Well, he’s going to push those limits every chance he gets. Yesterday in the briefing he started asking why his ships can’t just make the trip back to the Solar system and set up a mining operation on Mars. To get a 500-year head start. He said his crew can handle the years in stasis and they know how to survive on Mars.”

“There’s so much wrong with that idea, I don’t know where to begin,” Chava said.

Katsuo reached over her to lift the shade and peer out. “At least the hulls don’t glow as much in the daylight,” he said. He dropped the shade and grinned at her. “This is just how I imagined you’d look first thing in the morning.” He brushed a strand of hair from her eyes.

“This is how I look when my bladder is too full to ignore,” she said.

Katsuo sat up and swung his legs over the side of the bed to give Chava room to slide out.

By the time Chava finished in the toilet, Katsuo was laying out tea and lentil cakes.

“I’m starving,” Chava said. “I think the symbionts require extra energy.”

“I hope this is enough,” Katsuo said. “Go ahead and eat while I get ready.” He headed to the toilet, but turned back. “We have to face the day, don’t we?”

Chava nodded. The lentil cake stuck in her throat. Poor Johann. “I guess I need to plan some sort of memorial.”

“In time,” Katsuo said. “Not in the middle of this.”

“And the colonists haven’t even seen Owen and me yet.” Chava drizzled more honey on her lentils. “May I borrow your

hoodie jacket to go out?” she asked. “I need to go to my station to check Shailey’s results on those samples.”

Katsuo’s expression softened. “Sure,” he said. “And I need to get to Number Nine. I’m not sure I have enough sedation for this situation.” He ducked into the toilet.

Chava had finished eating by the time Katsuo returned. “I’m heading out,” she said, and grabbed the jacket from its hook by the door. “I’ll come back for my things later.”

Katsuo nodded and plopped into a chair. Chava waited, chiding herself for hoping, for what? That he’d say, thanks for last night? I love you?

But he simply pinged the door for her. It slid open without incident.

Chava kept her head down and hurried to the science hab’, ignoring grunts of disgust and shrieks of horror from people encountering the tacky surfaces as they exited their domiciles.

“Shailey, any news?” she asked at her station.

“Preliminary results,” Shailey said. “It’s a complex biofilm produced by an organism that defies our current classifications. I don’t have conclusive results to explain how it interacts with the metal alloy of the hulls or the polymer compound of the ramps.”

Kapi burst into Chava’s station. “It’s spreading,” Kapi said. “The well-drilling crew said they were almost to the water table when the auger seized. They pulled it out. Its tip and about two-thirds of its shaft were gone.”

Chava wrinkled her nose at a smell like burning plastic. “Kapi, what’s your lab coat made of?”

“Good old fashioned polyester,” Kapi said. “Why?” Kapi looked down, gasped and ripped off the lab coat as it shriveled to a pile of lumpy goo.

“And your jumpsuit?”

“Hemp fiber,” Kapi said. With her eyes on Chava, she ran her hand over the jumpsuit.

“It’s intact,” Chava said, and Kapi let out her breath.

Owen bounded into Chava's station. "What's all the commotion?" He braked just short of the mess on the floor.

Kapi stepped back with a gasp, covered her mouth and pointed at Owen's kaleidoscope face.

Owen ignored her. "Chava," he said, "are you listening to them?" He closed his eyes. "I don't have words. Can you imagine their shock—metal alloys, synthetic polymers—this world has never known them." He clapped his hands, and Chava squelched the memory of Johann doing the same thing. "But this response is goodness," Owen said. "It is good."

Kapi wiped her forehead. "I don't feel so well," she said.

Chava pulled out a stool, and Owen reached out his hand to help Kapi sit.

"Don't touch me," Kapi said, waving him away. "I've had enough surprises for one day." She looked at the floor. "Captain's pinging," she said, listening, nodding, and then glowering and shaking her head. "Yes, sir," Kapi said at last, and put her head between her knees. "I have to pull myself together," she said, without raising her head. "Captain wants a briefing. Says it's time for the colonists to know about you two. As if the biofilm isn't enough. I have 15 minutes to figure out what I'm going to tell the officers and crew." She straightened, patted her coarse hair and smoothed her jumpsuit. "I'll be in my office. Be ready when the captain calls you. In the meantime, keep working on this—" she waved her hand and left.

Chava grabbed some gloves and a sample bag. She crouched and scooped the remains of Kapi's lab coat into the bag.

"What can I do to help?" Owen asked.

"You're still a patient in Sick Bay."

"I'm fine. Katsuo just hasn't given the formal discharge order."

"I'll go to the briefing," Chava said. "I don't think you're ready."



Owen glanced down at his Sick-Bay issue pajamas. “I’ll go to my hab and get dressed.”

“That’s not it. The residual shock. You don’t seem like yourself.”

“You don’t know me,” Owen said. “I’m more myself than I’ve been in a long time. So let me help you. What can I do while we wait for the briefing?”

“If you really want to do something, go outside and find something affected by the biofilm. Something metal that’s small enough for Shailey to scan.”

“But it’s already in the lab,” Owen said, pointing at the bag in Chava’s hands.

“I need to study how it’s interacting with various materials at a molecular level,” Chava said.

“This is a sad way to use my engineering skills,” Owen quipped, and turned toward the exit.

“Wait, you’ll need to borrow this hoodie,” Chava said, handing him Katsuo’s sweatshirt.

Owen tugged the garment across his shoulders and thrust his arms through the too-short sleeves. “I won’t bother trying to zip it,” he said, and flipped up the hood. “At least my head fits.”

Kapi stepped back into Chava’s station. “Sorry to be such a wimp,” she said. “You should be the one addressing this crew. Did Shailey find any similarities between the microorganism producing the biofilm and the ones you’ve acquired?”

“We don’t know. We don’t have taxonomies figured out yet.”

“Could this be the first organism we’ve discovered that acts like a pathogen?”

“I’m not ready to call it that,” Chava said. “It causes damage, but not disease.”

“Nor have we found anything that’s a true parasite,” Shailey interjected. “In fact, we have yet to find an animal that acts like a predator.”

“They have to be here,” Kapi said. “What’s the food chain, then? Predation spurs adaptation and evolution.”

Chava’s symbionts buzzed in a tone she recognized as a query. (Plants make food from sunlight), she answered, forming a mental image. (Some animals eat the plants. Other animals eat animals that eat the plants.)

The symbionts buzzed more frenetically. Chava tasted confusion, sadness and anger. (I don’t understand you), Chava said. (My embee used words.)

<These are old ways>, the symbionts said. <Words are not enough.>

“Are you okay?” Kapi said.

“I’m still getting used to them,” Chava said, rubbing her arms. She shrugged. “It was like this when my embee woke up. It took years for us to understand each other.”

“You look a little shaky,” Kapi said.

“I’m just hungry. I’ll grab a snack so I don’t faint in the briefing.”

Chava reached for a drawer where she’d stashed a few food bars. The handle shimmered with faint color. She rummaged for silicone gloves and her symbionts queried again. (To cover my hands), she said. (So I don’t touch the biofilm.)

<The biofilm is goodness>, her symbionts said, and flooded her with calm. She turned back and tugged at the drawer to open it. The pulsing biofilm had already perforated the food bar wrappers and changed the bars to gooey clumps.

“Oh, Kapi,” she said. “It’s in the food.”

(This is not goodness), she told her symbionts. (This is my food.)

<Not food>, the symbionts said. <Food will come.>

Kapi stood with her hands on her hips, shaking her head.

Their links pinged. “Officers and section leaders to the conference room,” Althea said. “Except Rosenberg and Dishta, who will stay on the link and come at my summons.”

Kapi threw up her hands and left, passing Owen as he returned carrying a plastic pail jiggling with color. His symbionts flowed serenely.

“We should be terrified,” Chava said.

“But we’re not,” Owen said.

“I owe you an apology,” Chava said. “I heard it, too. They told me about the goodness.”

Owen looked down at his hands, which were gripping the pail. “Have you touched it? It feels...nice. Therapeutic.”

Chava reached for the pail. Owen relinquished it reluctantly.

Its handle was pliant and matched the temperature of Chava’s hands. It emitted a subtle tingle. “Let’s give it to Shailey,” she said.

A moment later, Owen said, “Chava, you’re still holding it.”

Chava set the pail in the immersion console and slowly withdrew her hands. “Now, we wait for the captain to call us,” she said. “You’d better hurry and change into clothes.”

“People will shit their pants when they see us,” Owen said. He touched his temple. “Briefing is starting. Sounds like Althea’s getting right to the point.”

Owen left and Chava listened.

Althea asked everyone to remain calm and to give the science team time to gather information. She called on Kapi to explain the sparse facts.

“It’s an extracellular matrix excreted by colonies of microbes,” Kapi said. “It seems drawn to materials made from petroleum products, synthetic compounds and metal alloys.”

“And processed foods,” Leah added.

“What about people?” Berat asked. “We heard there’s something wrong with Rosenberg and Dishta.”

“There are no reports of anyone being harmed,” Katsuo said.

“Before things fail, we need to sort and purge clothing, equipment and building materials,” Althea said.

“Food, too,” Kapi said, with an audible sigh.

“What about Shailey?” Katsuo asked. Chava heard the weariness in his voice.

“We can hope her organic matrix and silicone shell will be spared,” Kapi said. “But we have to assume some of her hardware is at risk. IT is working on a silicone shield.”

“Sick Bay is already compromised,” Katsuo said. “And it’s hell for the people in Number Nine. All I can do is keep them sedated.”

“We’ll get you more help in there,” Althea said.

“Don’t get my hopes up,” Katsuo said. “I know you don’t have anyone to spare.”

“That’s why we need Rosenberg and Dishta,” Althea said.

“Chava and Owen, that’s your cue.”

“Now?” Katsuo said. “With all due respect, Captain, I have my hands full already.”

“So, now you’ll have four more hands,” Althea said as Chava and Owen entered.

There was a collective intake of breath.

“We call them symbionts,” Chava said. She took a cue from Owen and stood straighter, lifting her chin and turning her head.

Questions erupted in a clamor until Althea raised her hand.

“One at a time, please,” she said.

Owen spoke up. “They saved my life,” he said. “Unless they’re pulling some cosmic bait and switch. Of course, we have a lot to learn about them. But they give me the sense that there’s far more to being alive than we could ever imagine.”

Chava exited the briefing without her hooded jacket. The breeze caught her hair. She stopped to enjoy a full breath, unconstrained by the secret of her symbionts, and then went to reclaim her belongings from Katsuo’s domicile. He was still at

work in Number Nine, but his scent lingered—augmented by her symbionts, she guessed—filling her with a yearning that merged with the gentle buzz of the biofilm already glossing the walls and softening the floor.

<It is goodness>, her symbionts said again. She brushed her palm across Katsuo's desktop and savored the biofilm's quavering whisper.

The biofilm slowed its progression over the next few days, as if gluttoned by its consumption of structures, furniture and equipment. Shailey remained intact, but the biofilm weakened heavy machinery, bringing habitat conversion to a halt.

Owen organized the piles of damaged furniture, tools, housewares and personal belonging. Bedsheets replaced door panels. "Be thankful it's summer here," Owen said, "and that the composting toilets work manually."

Silicone containers became prized receptacles for rain water and belongings. For reasons unknown, the hydroponics station still functioned, but processed food packets disintegrated, spoiling food bars, dessert mixes, and other comfort foods from Earth.

Communal meals became a high point of each day's routine: not just to pool food, but to share news.

Wearing a mask to protect the patients in Number Nine from the shock of the symbionts, Chava diverted time in the lab to provide them with therapeutic activities.

As people with milder symptoms began to recover and leave Number Nine, Althea called on Chava to offer activities for the whole colony. Chava built on the repertoire she'd developed during the voyage, but the work demanded a energy and focus hard to muster.

When people remarked on her acting skills, she missed her mother; on her story-telling skills, she missed her father; on her

pastoral skills, she missed Bree; on her voice, she missed her *malak*.

At night, alone, she cried herself to sleep.

One night, she went outside and placed her body against the hull of her domicile, craving the pulse of the biofilm. She rested her cheek on the pliant surface; it warmed with her tears. Overhead, the alien sky throbbed with thick ropes of stars and the back-lit dust cloud. She felt the planet's spin and the sling-shot pull of its orbit.

A shadow slid over her; slow and smooth as an eclipse. Chava raised her eyes to see the arch of a dactyl's wing. The animal seemed to appraise her, blinking its warm, yellow eyes. Its wings vibrated, creating a buzz that harmonized with the sounds in and around her.

<Your tears called it>, her symbionts sang. <It says you are home here, home here. Here is shelter.>

Yet, the days blurred. Often working near Katsuo, whose mind and heart were consumed by the work in Number Nine, Chava felt more alone than ever in her life.

Chava, there's a pattern here, she said to herself. You gave your heart to another physician? Really? What did you expect?

<You are not alone>, her symbionts cajoled.

A faint reflection of the night sky flowed into Chava's mind. She heard the thrum of the savanna, a nanosecond out of sync. Owen's link? she asked.

<You are not alone>, the symbionts said, once more.

(We did not choose this connection), Chava said. (It's not natural for our kind.)

<But we chose you>, they answered.

Unless Owen reached out to her, she couldn't read his thoughts, but his mind teased her. Sometimes she caught a scent like dry sand or fresh rain, or saw a shape that resolved into an arid landscape, or heard resonant voices full of longing.

The connection warmed her vagus nerve and pressed her solar plexus like an intimate embrace. Like being in the arms of Grandma and Grandpa Rosenberg. Like sitting with Isaac and feeling safe and understood.

(I should tell Katsuo), she told her symbionts. (Will he understand? Does it matter? Is he more than a friend?) But each time she saw Katsuo's weary, stricken face, her courage wilted.

On a rainy morning after Chava pulled a night shift in Number Nine, she ducked into her office before heading home to sleep. She found Owen outside her door, his back straight, his eyes calm, and his symbionts blooming and retracting in sync with his breath.

"How long have you been waiting?" she asked.

The question flickered across his face before he answered. "Time is different here," he said. "They help me expand the present." He stroked one forearm and smiled. "You know this," he said.

"We need to talk about this link we have," she said.

"I welcome it," he said.

"So you consent?"

"Yes. Do you?"

"I feel like I'm cheating."

"On Katsuo?"

She nodded. "But, it's complicated."

"I can't help you there."

Katsuo pinged just before lunch. "I'm coming to the Commons for the meal," he said. "See you there?"

"Good," she said. "I'm glad."

In the strange midday light, Chava took a bucket seat next to Katsuo. Owen sat across the table, toying with his soup. His symbionts signaled for caution and Chava's symbionts synced with them. "The lentils?" she said aloud.

"What about them?" Katsuo said. He glared at Owen and put down his spoon. "Enjoy your lunch," he said and strode away.

“Go after him!” Owen said.

Chava dashed to the Med Hab. She drew back the curtain just as Katsuo kicked a chair. “Damn thing won’t hold me anymore,” he said.

“Katsuo, talk to me,” Chava said.

“Oh, pardon me, but I’ll have to use actual words,” he said.

“It’s the symbionts,” Chava said.

“Even if that’s all it is, how would you feel if I had Leah or Celia in my mind?”

“What do you want me to say?”

“I love you?” Katsuo said.

“I want you to say it,” Chava said.

Katsuo pulled her close. She felt his heartbeat and the rising and falling of his breath.

<This is goodness>, her symbionts said.

“I love you,” Katsuo said.

There is was. He actually said it. But her anxiety rose instead of abating.

“But, you’re so far away, even when I’m right beside you,” she said.

“I can’t promise,” he said. “I won’t promise that work won’t take me away from you, even when we’re working side by side. I can’t promise I’ll be fully present every time I’m with you. I can promise that, if I’m distant, it’s not because I take you for granted.” He pulled her away from him and lifted her chin with one finger. “Just a kiss,” he said. “To seal it. And let the anticipation build for something more.”



## Chapter 29

*“See the sun rise over her skin/Don’t change it/See the sunrise on her skin/Dawn changes everything—” Heartland by Bono, from Rattle and Hum, U2, 1988.*

Several days passed before something more could happen. The grind of work did not let up. At the end of Chava’s final shift that week, she pinged Katsuo to check in.

“I’m taking tomorrow off,” Katsuo said. “My place or yours?”

“Mine,” Chava said. “You bring the wine.”

“My supply is getting low. Someone needs to find a substitute here.”

“We’ll ration it,” she said. “I wouldn’t want you to fall asleep in your dinner.”

They ate tofu and tomatoes and shared a glass of wine. Katsuo, who was naturally more talkative than Chava, steered the conversation away from work. An hour passed before Chava realized she was laughing and enjoying the verbal sparring.

“What’s your favorite thing about this place so far?” she asked during a comfortable lull.

“Besides you? The night sky. You?”

“The sounds. I want to go out to the savanna and sing.”

“Why don’t you?”

“Maybe I will. But not now.”

“What would you like to do instead?”

“I’d like to clean up dinner and light a candle.”

“I’ll help. If you’ll sing a song just for me.”

“Why? Why do you want me to sing?”

“Because I want to hear your voice. And then I want to make you sing.”

The candle threw quavering shadows on the wall in Chava's sleeping nook. She unzipped her jumpsuit and Katsuo eased it from her shoulders. She closed her eyes as they lowered themselves onto her bunk.

Breathless for Katsuo to discover the curves of her waist and hips, Chava was not disappointed as his hands moved as if memorizing the terrain. Her symbionts released ribbons of light in her visual cortex that traced the path of his fingers on her skin. He kissed her nipples. She gasped at the shock of pleasure, and then she softened and fit herself to him. She felt Katsuo's racing heart, but there was no nervous chatter. Instead, he whispered, "This? Here?" He pushed her beyond the boundaries of skin and muscle. Her nerves sang. He clung to her afterward and held her until the little, quaking aftershocks subsided.

Owen cheered through his link with Chava.

(We're going to have to learn how to dampen the links), she told her symbionts.

The next evening, in the opal twilight, Chava and Katsuo walked through the tall red grass, beside the stream named Tinkerbells for the sound the water made as it broke over small rocks. The moons had risen. The primary moon was full and the secondary one was a crescent, delicate as an eyelash.

Chava touched Katsuo's cheek. "The light plays tricks, this time of day," she said, as a shadow moved across his face. The dark shape in the hollow below his cheekbones deepened and shimmered, forming faint magenta and violet swirls. "Ah, Katsuo," Chava said, fingering the patterns. "I hope you're ready for this."

"I thought it was tinnitus," he said, laying his hand atop hers. "You didn't tell me they sing."

She wondered if his symbionts would transmit messages that his brain would interpret as language.

"It's not quite singing," he said. "There's no word for it. It's like a current all through my body that I can hear and feel." His

fingers fluttered to his face. “Well, now we know they’re sexually transmitted. Unless you bit me.” He gave her a sidelong look.

Chava held her breath, waiting for a reaction she couldn’t predict.

He kissed her.

“So, that’s it? You’re not going to freak out?” she said.

“I told you. I didn’t want you to face it alone.”

# Chapter 30

*“In the octopus’s case there is a conductor, the central brain. But the players it conducts are jazz players, inclined to improvisation, who will accept only so much direction. Or perhaps they are players who receive only rough, general instructions from the conductor, who trusts them to play something that works.”*  
*Other Minds: The Octopus, the Sea, and the Deep Origins of Consciousness* by Peter Godfrey-Smith

“Why are we running?” Chava asked as she trotted beside Kapi across uneven terrain about a half-kilometer from base. “I’m surprised I’m not panting. When did I adjust to the atmosphere?”

“Maybe you’re getting a boost from those little critters under your skin,” Kapi said. “I can make you sprint if you want to test your limits. Hurry. I want to show you something.”

A sound like a jazz clarinet choir spurred Chava to pick up her pace. She heard at least four different harmonies and a hint of dissonance in long runs of notes, trills and slow slurs that seemed to form calls and responses.

Kapi’s kinky hair bobbed as she broke into a full run and led Chava to a crest where she pointed to a hollow thick with bushes and mushrooms. Below, six ‘dactyls strutted in a circle, with their pink wings extended and shimmering in the late afternoon sun. The ‘dactyls alternately swelled their throats and extended their necks to point their long beaks skyward and release reedy calls.

Kapi motioned for Chava to drop to the ground. They crawled through the fragrant grass and mushrooms to get a closer look.

Chava’s symbionts began to pulse and her eardrums tingled with a new sound: a rising and falling chorus that filled the air like cicadas on an August day in Chicago.

“The thing that bit me made that sound,” she said. “Churrr, churrr, churrr.”

“Sounds like a bunch of them,” Kapi said. “I think they’re inside the trunks of the bushes.”

Abruptly, the churring stopped, leaving only the thrumming of the savanna in their ears.

The ‘dactyls folded their wings, retracted their necks, and tilted their heads back, with their beaks still pointing to the sky. They began to blow a single, ragged note.

A chill ran up Chava’s spine and then she bowed her head. “It—it sounds like a shofar,” she said.

Kapi laid a hand on Chava’s shoulder. “Look, she said. “There’s a ‘dactyl in the middle of the circle.”

A ‘dactyl they hadn’t seen before lay gray and motionless.

The mournful blowing faded and the ‘dactyls shuffled backwards, widening the circle.

A trill of churring voices resumed. The small animals streamed from the trunks of the bushes nearby and assembled an inner circle around the lifeless ‘dactyl.

“Churras,” Chava said. “We should call them churras.”

The ‘dactyls in the outer circle extended their necks and lowered their heads so their beaks touched noses with the churras. The dactyls blew another note in unison, and then widened their circle and rose in the air and Chava felt the pressure from their beating wings in her sternum.

The churras swarmed over the dead ‘dactyl. At first Chava thought they were eating it. Instead, they carved it into pieces which they dragged into the trunks of the bushes.

Chava rested her head on her arms. “I don’t know whether to weep or throw up,” she said.

That evening, she told Katsuo about the ‘dactyl funeral. “It struck me,” she said. “We’ve been approaching this all wrong,” she said. “Always trying to be positive, diverting our confusion and

sorrow. We need to lament. Healing never comes without grieving well.”

Chava sat straight up in bed. Her skin tingled. “I think I’m going to be sick,” she said, covering her mouth. Katsuo’s side of the bed was empty; he’d had already left for work. Chava threw back the covers, swung her legs over the edge of the bunk and waited for the wave of nausea to pass.

<A new host>, her symbionts said.

(What the hell does that mean?) Chava countered. She got up and dressed as a new surge queasiness washed over her, and then stepped outside under a pale sky into air that smelled like rain, and hurried to Katsuo’s office.

“Hey,” he said. “Sorry I had to leave so early. I hate getting up now, with you in my bed.” He put his hands on her shoulders and kissed her lightly. “You OK?” he said. “You’re pale.”

She shook her head. “Something’s off,” she said.

“Do you want me to do a quick exam. Like a real doctor?”

Chava laughed when Katsuo asked Shailey to check the date of Chava’s last menstrual period. “How do we track dates now?” Chava asked, and realized before Shailey confirmed it, “It’s late.”

“I’ve been seeing that a lot,” Katsuo said. “Time doesn’t work the same in wormholes and planets with lower gravity. But I need to check for pregnancy.”

“There’s no way.”

“There’s always a way if sex is involved,” Katsuo said.

“It’s statistically improbable, but not impossible.”

The noninvasive scan took a few seconds.

“Holy shit,” Katsuo said.

“What?”

“You *are* pregnant, Chava. I don’t know what to say.”

Katsuo’s console pinged with more results. He read them and expelled his breath in a slow hiss.

“What’s wrong?”

“The DNA. It’s all yours. And the symbionts’. There’s none of mine. Your follicles produced two eggs this cycle...”

Chava’s symbionts began a new song. <We used both eggs to give complete information for a new host>, her symbionts said.

“You’re shaking,” Katsuo said, placing his hands on her shoulders.

“My symbionts said, ‘new host.’”

“How could they manipulate your cells? As far as I know, no one has ever combined the chromosomes from two human ova to restore the diploid state.”

“They cloned me?”

“No.” Katsuo’s grip on her shoulders tightened to steady her trembling. “A clone is created by removing the DNA from the nucleus of an egg and fusing the egg with another cell. If the symbionts restored the diploid state, they used the DNA from each ovum. So the chromosomes would have DNA from both of your parents, in slightly shuffled variations, not identical to yours. This—result—would be more like a sibling. I think.”

“I can’t feel my arms and legs,” Chava said.

Katsuo grabbed a thermal blanket and helped Chava lie down.

“Your human chorionic growth hormone level is strong, by the way,” he said, stroking her forehead. “That’s why you’re queasy.”

“Why would they do this?”

“Life is relentless,” Katsuo said. “It always finds a way.”

# Chapter 31

*“It looks like a joke,” said Arthur...The Universe could not possibly work like that, he thought, cannot possibly. That would be...as absurd as, as absurd as...he terminated that line of thinking. Most of the absurd things he could possibly think of had already happened.”— From *Life, the Universe and Everything*, by Douglas Adams, Pocket Books, New York, New York, 1982*

Kapi waved at Chava from the science hab’s open airlock where a bedsheet curtain fluttered in the morning breeze. “I was just coming to get you,” Kapi said.

“Oh, no,” Chava said. “I’m not in the mood for any more lessons about the circle of life on EpsIndi I.”

Jacob joined Kapi on the ramp, spreading his arms like a tightrope walker to keep his balance on the bouncy surface.

“Sorry, doctor, but this is what you signed up for,” he said, raising a small case in one hand. “I’ve already retrieved your sampling kit.”

“We’re going on a walk,” Kapi said, and led with a springier gait than the lighter gravity explained.

“Why are you two in such a good mood?” Chava asked. Maybe it was a small sign that the colonists were recovering.

“You’ll see,” Kapi said. “You look a bit sleep deprived, Rosenberg.”

“Who isn’t?” Jacob said. “And who knew it would take so long to adjust to the effects of lower gravity? My thoughts are rushed and I can’t turn off my brain at night.”

“They told us time would pass more quickly here, but I thought they were full of shit,” Kapi said. “I was wrong. There literally aren’t enough hours in the day to begin with and they pass too fast. But my comment was a jab at Chava’s relationship status.”



“Oh, that’s an adjustment, too,” Chava said. “Don’t get me wrong—I love having Katsuo in my bed—but I’m sometimes too excited to sleep.”

“I’ll start losing sleep if Leah ever has a baby,” Kapi said. She nudged Jacob in the ribs. “Hey, are you a donor? You’d make cute babies.”

Jacob blushed. “We have to wait for things to stabilize before we start making babies,” he said.

“I saw you with Renata,” Kapi said. “We’ll see about that.”

Chava smiled with the secret of her pregnancy. Her symbionts tuned to the thrumming savanna. A few bright-winged creatures spun out of the grass ahead of them.

“We call those spiral cooties,” Kapi said. “Still working on those new taxonomies. The spiral cooties have segmented bodies like insects, but they lack an exoskeleton. They have a firm, flexible biofilm shell. I’m trying to figure out their ecological niche. We still haven’t found any predator.”

They came to the crest of the hollow. Kapi pointed and shaded her eyes with her other hand.

A thick layer of flakes covered the grass, reflecting pink light like tiny mirrors. A few flakes glinted on the mushrooms.

“What the hell,” Chava said.

“Keep your eyes on the funeral trees,” Kapi said.

“Funeral trees?” Jacob squinted.

“That’s what I’m calling the bushes,” Kapi shrugged. “It’s not pretty, but it’s apt.”

The funeral trees’ drooping, flower-laden branches began to straighten in a synchronized arc, like the ribs of an umbrella turned inside out by the wind. Each branch’s main stem contracted and then extended, flinging glassy pink flecks from the mouths of the turquoise flowers. Chava watched the breeze catch the shining flakes and spin them as they floated downward, tinkling like wind chimes. They settled on the grass, but the mushrooms pulsed to repel them.

Jacob scrambled down the hill before Chava could caution him. “I’ll collect some,” he said.

“Protocol,” Chava reminded him.

“I’ll be careful.” Jacob snapped on gloves and used forceps to gather a few flakes and drop them in a sample bag. Looking a bit cross eyed as one of the tiny, corkscrew-winged creatures landed on his nose, he asked, “Are there more spiral cooties than before?”

“I think you’re right,” Kapi said. “And jelly bats, lace weavers and carpenter monks. Looks like several animal classes like this stuff.”

“It’s like manna,” Chava said.

“We should stay awhile,” Kapi said. “See who else shows up.”

As they took a few steps toward the bottom of the hollow, the ground began to tremble. Chava reached for Kapi.

“Seismic activity?” Kapi shielded her eyes with one hand to peer into the distance.

A dark, undulating mass rose like a mountain range on the horizon.

Chava’s stomach heaved. She dropped to her knees and slowly parted the tinkly, flake-covered grass, mustering the courage to look. The ground quivered as the mass advanced by projecting a pseudopod and flowing into it. It covered the ground quickly and as it got nearer, Chava saw pulsing organs and delicately ringed support structures inside its pearlescent skin. It had no face, and nothing resembling a mouth or nose. Clear bulbous protrusions circled its midsection. At the back of each bulb, a honeycomb structure reflected the light.

“Are those its eyes?” Chava asked.

Kapi didn’t answer. She had fainted.

Chava scooted to Kapi’s side. Something brushed her leg. She gasped as a churra leaped onto her thigh and then onto her shoulder. “Go away,” she hissed and tried to dislodge it, but it dug

its claws into the fabric of her jumpsuit. “Get!” she said. It churred, tuning to the harmonics of her symbionts. Her annoyance seeped away. Chava wrapped her hands around the churra’s middle and stroked its warm, firm, pliable skin. “Shit, are you putting a spell on me?” The churra coiled its tail around her neck and trilled in her ear. Chava felt a surge of warmth around her vagus nerve. Calmer, she looked for Jacob and found him crawling toward the purple blob.

“Jacob,” she called. “Get over here. Bring the first aid pouch.”

Kapi stirred and groaned. “I’m ok.” She braced on one elbow and squinted at Jacob’s gangly approach. “No smelling salts, please!”

Jacob helped Chava settle Kapi into a cross-legged position with her head between her legs. The trio huddled as the beast slogged forward, sucking up the pink flakes in its path.

The flakes tinkled in counterpoint to the rumbling of the undulating ground, creating harmony with the churra’s mid-range trill. Chava’s symbionts sang along. They found a single word: <Home, Home, Home.> and the music enveloped Chava until the only thing that seemed strange in her environment was the presence of two other humans.

Jacob tugged at Chava’s shoulder. “It’s headed right for base camp,” he said.

Chava took a deep breath. “We have to protect it,” she said. “People will panic.”

“I’ll run ahead,” Jacob said. “What should I say?”

“There’s a protocol for this,” Kapi said, struggling to her feet and leaning heavily on Chava. She searched Chava’s eyes. “We have to protect the camp, too. Are you with me, Chava?”

“Yes,” Chava said, and her voice sounded far away.

Jacob’s curly head bobbed as he sprinted toward the command hab.

Seconds later, Chava's link pinged with a base-wide alert ordering colonists to stay indoors while the science team managed the encounter.

"What are we going to do?" Chava asked.

"I was hoping you had some idea," Kapi said.

"Let's get in front of it and see if we can steer it away from camp," Chava said.

The churra sprang from Chava's shoulder and dashed to the purple mass, diving into the pulsing membrane. Chava gasped, and ran to catch up, but Kapi grabbed her shoulder. "Please let me go," Chava said. "I need to—"

"You know better," Kapi said.

A clamor of human voices made them both turn. A mob of colonists from the Najaam Saeid camp approached, brandishing shovels, with Captain Berat Osmon in the lead.

Chava wrenched free of Kapi's grip and ran to put herself between the rabble and the beast.

About thirty meters from the advancing colonists, the purple mass quivered to a halt.

Althea Harrison pushed through the throng with Jacob right behind her. She rose on tiptoe to confront Berat nose to nose.

Chava couldn't hear what Althea said, but Berat lowered his shoulders and backed away.

He turned to his people and waved his long arms, booming the command, "Go home. Go back to camp."

The people raised their shovels and stood their ground.

"That's an order," Berat shouted, and the people turned to shuffle away, murmuring and glowering.

The churra popped out of the beast and catapulted onto Chava's shoulder. Shimmering images and spicy scents seeped into Chava's mind, along with the memory of an expansive hunger, now replete, but mixed with an intense longing. She queried her symbionts.

<This is the home builder>, her symbionts said. <It eats. It rests before it makes more of itself. You are safe. You are home. The home builder is here.>

“Kapi,” Chava said. “I think it’s going to reproduce.”

# Chapter 32

*“Nature would teach us that there is another way of operating a system, one that is not based on scarcity but on abundance and generosity. As ecosystems evolve in nature, they become more diverse. This diversity creates more resources (not less) in a system. This is because diverse plants and species need different nutrients to thrive, and they each generate abundant resources that they can share.”* From *What Nature Teaches Us About Diversity and Abundance*, by Dr. Kathleen Allen | Jan 23, 2020 | *Latest Insights*

Kapi set a steaming bowl of pink porridge in front of Chava.

The breeze rustled the biovinyl awning above their heads as they sat outside the rag-tag admin pod adapted from the main section of the flagship, on a gray day that smelled like rain.

“This is lunch?” Chava recoiled and the churra on her shoulder wrapped its tail around her upper arm.

“Take a deep whiff of it.” Kapi said. “I think it smells like cherries and almonds. The texture isn’t bad. Sort of like cooked oat bran, if you like that sort of thing.”

“What’s in it besides the pink flakes?”

“Milk from a nut that grows in the marsh. Nectar from the china flowers.” Kapi dipped in her spoon and took a bite. “I’ve been eating it for a week. It’s very satisfying.”

Chava coated the bottom of her spoon with the grainy mush and licked it gingerly. The slurry settled on her tongue with a nutty, creamy flavor. The cherry effect bloomed later. She tilted her head and nodded. “I’ll give it a chance.”

“Thirty-five percent protein, 20 percent fat and 45 percent low-glycemic carbs,” Kapi rhapsodized. “Loaded with calcium,

fiber and potassium— all the nutrients people struggle to get in their daily diet.”

“Can you do other things with the flakes? Make veggie patties? Flakeloaf? Matzah?”

“Food service is working on it,” Kapi said. “Well, not the matzah.”

Chava laughed and noticed a work team across the Commons replacing leaky plastic rain barrels with makeshift biovinyl containers. Chava liked the rainy days that came about every other week. Due to the lower gravity, the precipitation began as a sweet-smelling mist that hung in the air until the droplets coalesced and fell in large, gentle dollops.

Owen had fashioned a rain xylophone as a gift for Chava and Katsuo by stretching leaves from one of the marsh lilies over a frame of woven reeds. As a few drops fell, Chava heard the slow cadence of the instrument’s first muffled notes.

“Don’t let your *kai kai* get cold,” Kapi said, interrupting Chava’s reverie. “I don’t want to waste it.

“Why do you call it *kai kai*?”

“Just the plain old Tok Pisin word for food,” she said. “By the way, whatever you did to the lentils, it’s working. So, along with the pink flakes—the *kai kai*—I’m pretty sure we can survive until we figure out the next growing season. Even if you’re eating for two.”

Chava sputtered.

Kapi said, “What, you didn’t think anyone would notice? Girls built like you can never hide it. Have you told Althea?”

“I’m only about 10 weeks along.” Her hand flew to her abdomen. “Haven’t I caused Althea enough stress already?”

“She’s the captain and she can handle it. I’m more disappointed that you didn’t tell me. And that’s not all. Why didn’t you tell me your *churra*’s symbionts have human DNA?”

A pang of guilt triggered Chava’s defenses. “How did you get a sample?”

“You’ve been going to the bathroom a lot. Your critter stayed behind once. But that’s not the point. I should report you for withholding critical information. But I won’t. I guess it was bound to happen. Damn humans always change their environment.”

“I was waiting until I had a chance to do more study,” Chava said.

“Next time, tell me even if you don’t have it all figured out,” Kapi said. “You have a pattern of pulling this shit, remember?” Kapi stood and reached for Chava’s bowl. “I think you and your little friend should come with me and see what Owen is doing with the slime beast. Are you up for that?”

“It’s not slimy,” Chava said. “Its surface microbiome is related to the organism that generates the biofilm.”

“If you say so,” Kapi said.

They crossed the Commons and passed behind the science hab. The space where the alien beast had been stationed was now occupied by a new structure with a translucent, convex hull. Its surface seemed to rise and fall like the ribs of a breathing animal. As Chava and Kapi approached, an opening appeared in the hull and Owen stuck his head out.

“Can you believe it?” Owen said. “It’s mimicking a domicile. I can’t tell if it’s a defense mechanism, like camouflage, or something more purposeful. I may be crazy but I think it sent the biofilm in advance.” As Owen spoke, an incline extruded from the beast’s side to form a ramp. “I guess it wants you to come in,” Owen said.

Inside, the air was moist and warm, and smelled like rich dirt and cinnamon. Daylight filtered through the beast’s membranous skin. Around its midline, some of its eye organs had shed all but the clear lens, mimicking view ports.

“Kapi, look at this,” Owen said, pointing to a transparent pouch containing small, round spheres with ribbed surfaces, each attached to the wall of the pouch by a stem. “I think it laid eggs.” Owen hurried to another organelle. “And this pocket over here, its



gut, is full of the pink flakes. I need more time to study it. But I think we've found our titonka."

"I hope it's not too good to be true," Kapi said. "We can't use bed sheets for doors when winter comes."

Althea came up the ramp and into the chamber. "There's another thing that can't wait for winter," she said. "Our survey of the continent is long overdue. We need to make up for lost time. I need you all in my ready room for a meeting."

Althea's ready room seemed cramped and stifling, even though the conference table was missing and a circle of overturned silicone buckets took the place of chairs. At least Shailey was functioning, and an immersion showing one hemisphere of the globe hovered in the empty space.

Chava squirmed under Berat Osman's unfiltered scrutiny.

His arms rested on his knees, and he folded his skinny fingers, switching his heavy-lidded gaze toward Kapi. "Dr. Jara, you said these things are not contagious," he said. His first language was Turkish, and he spoke English with mincing care.

"I said the only way to catch them is through blood or secretions," Kapi said.

"They aren't airborne and they can't survive outside a host," Chava said.

"But the animal that bit you, it's out in the wild, yes?" Berat asked, glancing at Chava.

"We don't know how widespread they are," Kapi said. "We think the one that bit Chava was drawn to her wound."

"So much we don't know about this world," Berat said. "It is not easy. If you've noticed, my officers and crew are adjusting better than yours."

Althea shrugged. "What's your point?"

"It's merely an observation," Berat said.

"Nonetheless, we need teams from both ships for the survey," Althea said. "Supplies are already strained, so we have to be smart about it. Let's get busy and sort our materials. Owen is in

charge of taking inventory of local sources of food, fuel, fiber and shelter. We have communication drones that survived the biofilm. Let's put our survival skills to use. It's not going to be summer here forever."

The days were noticeably shorter by the fourth week of autumn. Chava wore loose jackets to hide her belly. Her pregnancy approached 15 weeks, and she had a proper bump.

"You're measuring at least 18 weeks," Katsuo said one night as they got ready for bed.

"We're going to have to break it to Althea," Chava said. "With the survey teams gone, things have settled down and I think she can handle it." Chava climbed into the bunk and waited for Katsuo to join her. She turned her face to his. "Maybe we shouldn't complicate the situation by telling Althea that you're not the father."

Katsuo stared over her shoulder, thinking. "I believe we should tell her the truth," he said.

"I'm just trying to manage the amount of water flowing over the dam," Chava said.

"What if there are more spontaneous pregnancies?"

Chava's symbionts brightened.

Katsuo touched her face. "What are they doing?"

"Trying to tell me something they don't have words for," she said. "Something like, necessary. Special. First mother."

Katsuo sighed. "Ok, then. I just hope it doesn't happen again. At least, with the normal way to make a baby, we have some control."

"I'll make an appointment with Althea," Chava said. "Let's have Kapi there, in case Althea faints. Kapi already knows."

"You told her?"

"She guessed."

Althea was on time for the meeting in her ready room.

"This better not be about another creepy alien discovery," she said, tilting her head toward Kapi.

“No, sir,” Katsuo said. “Just an announcement.”

“I’m pregnant,” Chava said, while she still had the courage.

Althea slapped the table. “Allah have mercy,” she said. Her face scrunched and her eyes brimmed with tears. “This isn’t just about protocol,” she said. “I—care—I love—shit—” She wiped her nose with her sleeve. “Are you even sure it’s viable?”

“She is healthy. She. A girl,” Katsuo said.

“She has a name,” Chava said. “Allegra, after someone dear to me. Some one you remind me of.”

“And Allegra is developmentally advanced,” Katsuo said.

Althea’s eyebrows shot up. “That can’t be good. In what way is she advanced?”

“Neurological development is ahead of schedule,” Katsuo said.

“Does she have...those...things?”

“Yes,” Katsuo said. “It appears they cross the placental barrier. Persistent little buggers.”

“Captain,” Chava said. “I think the symbionts are embedded in the matrix of this planet. We may need to learn to live with them.”

“Baby steps,” Althea said. “Pardon the pun. I didn’t expect two highly indispensable crew members to risk so much to jump start the process. Katsuo, you’re a doctor. What kind of example is this for the rest of the colony?”

“I took the injection,” Katsuo said. “You can verify my medical record if you wish. But, no contraceptive is 100% effective.”

Chava squeezed his hand.

Althea braced her hands on her thighs and stood. “You got me there,” she said. “And, Chava? I’d say you are glowing, but I’m not sure if it’s from the pregnancy.”

# Chapter 33

*“Consciousness is somehow a by-product of the simultaneous, high-frequency firing of neurons in different parts of the brain. It’s the meshing of these frequencies that generates consciousness, just as tones from individual instruments produce the rich, complex, and seamless sounds of a symphony orchestra.”*  
– Francis Crick, Co-Discoverer of DNA

Sunlight streamed through the view port onto Chava’s work space at an angle marking the planet’s autumn tilt. As the daylight hours shortened, Chava fought the urge to hunker down for winter. There was too much work to do. Besides studying the planet’s resources for habitats and food, she kept busy helping Kapi log biological samples sent via drones from the survey teams. Her churra, constantly draped across her shoulders, soothed her and helped her focus.

Beside her, Kapi smiled. “You and that critter are a pair,” Kapi said. “I don’t think you’re even aware that you’re constantly humming.”

“Let me know if it bothers you,” Chava said. “My classmates in grad school hated that habit.” She raised a water sample to the light and examined it for large particles.

“Is that from Oceana?” Kapi asked.

“Yes,” Chava said. “From a coastal lagoon. I’ve identified several species of microbes similar to the symbionts. Especially associated with that kelp-like organism. It’s a lot like Earth kelp. Its metabolism depends on symbiotic activity. I think the kelp has something to do with the symbionts’ life cycle. It reminds me of a science fiction short story I read when I was little. The premise was that paper clips, pennies, hair pins, coat hangers, and bicycles

were all the same organism, just at a different stage. Creepy and funny and fascinating.”

“Creepy,” Kapi sighed. “It’s even more creepy that I’m getting used to things being creepy. It’s interesting— based on early survey reports— that the churras are everywhere. They’ve adapted to different habitats.” Kapi suppressed a shudder. “I used to think they’re cute,” she said.

“I’m getting attached to mine,” Chava laughed. “Besides, somebody has to do the dirty work on this planet. You know, I just realized the Alpine team hasn’t sent any samples in more than a week. I need soil samples. I wish Sisar Roca was here. I’m a bit over my head. But, at least the biofilm isn’t wreaking havoc anymore, and the drones are still working. Do you mind if I send a query to the Alpine team?”

“Go ahead,” Kapi said.

Before Chava could ask Shailey to program a drone, Katsuo sent an urgent ping. “I need you in my office. Now,” he said. “Get here as soon as you can waddle.”

“I’m only 15 weeks,” she said. “I can still skip like a gazelle.”

“Come straight to the exam room,” Katsuo said.

“I can’t imagine what Katsuo wants,” she said to Kapi.

“Maybe a little afternoon delight,” Kapi said with a wink.

“Not in the Med Hab’,” Chava said. “Katsuo’s a purist when it comes to his profession. I’ll be back as soon as I can.”

Chava announced her presence and opened the privacy curtain.

Jacob Friedman was perched on a wobbly, biofilm-coated chair beside a young woman sitting on the exam table whom Chava didn’t recognize.

The woman’s ash blonde hair fell in tight curls to her shoulders. Her hazel eyes were wide, and her pale skin danced with intricate saffron and emerald swirls.

“Shit,” Chava breathed.

“Renata, are you still willing to tell Chava what happened?” Katsuo asked.

Renata locked eyes with Jacob, who looked down at his shoes. “Jacob and I went for a walk,” Renata said. “An animal bit me.” She pointed to Chava’s churra. “An animal like that one.”

“When did this happen?” Chava asked.

“Two weeks ago,” Jacob mumbled. “We should have reported it. But at first we thought everything was fine. The bite healed immediately. The things appeared sort of gradually.”

“She’s pregnant and Jacob’s the father,” Katsuo said in a carefully measured tone.

Chava’s churra hopped off her shoulder and scurried to the privacy curtain, sniffing and trilling. The hem of the curtain lifted and a small, delicate churra burst into the room.

Katsuo lunged for it, but it slipped through his hands and leaped onto Renata’s shoulder. “This is what happens when you use bed sheets for doors,” he said.

Renata squealed as the churra nuzzled her ear and trilled. She wrapped her hands around it, but instead of pulling it off her shoulder, she began to stroke its back with a trembling hand. The churra’s patterns aligned with her symbionts.

Chava touched the churra’s tail. “You’re going to be okay, Renata,” Chava said. “May I examine your churra for a moment?”

“It isn’t mine.”

“It is, now.”

“What are you looking for?” Katsuo asked.

“Its genome,” Chava said.

“I’ll get a kit,” he said.

Chava spoke softly to Renata while she swabbed the churra’s mouth. “Would you be willing to keep a log of sensory input, like sounds and smells and colors, of thoughts and other responses to the symbionts? We need to learn how they interact with different individuals.”

Renata looked at Jacob. He shrugged.

“It’s your decision, Renata,” Chava said.

“I can do that,” Renata said.

“Jacob,” Chava said, “have you two had sex since this happened?”

Jacob blushed and stared at the floor. “No,” he said.

“It’s the least you can do,” Katsuo said. His eyes were narrow and he was gripping his medical scanner with white knuckles. “So you can get them, too.”

“It’s not a bad thing,” Chava said, to salvage the moment. “They form a link, like our neural links.”

Jacob looked at his shoes again.

Chava queried her symbionts, and asked them to reach out to Renata’s.

Renata raised her eyebrows and rubbed her forearms. “I hear something,” she said.

“That’s good,” Chava said. “Now you can link to me any time you need to talk.” She turned to Katsuo.

“Thanks, Chava,” he mumbled. “Thanks for coming.”

Chava heard the dismissal in his voice. She returned to work, so distracted that her churra jumped from her shoulder and sat by the door curtain, as if it wanted to leave.

“I can’t accomplish anything more today,” she told Kapi.

“Go home, then,” Kapi said.

In her kitchen, Chava started pulling together a meal from leftovers, when Katsuo linked.

“I’ll be working late,” he said. “Dealing with Jacob’s fling put me behind.”

“Fling? So you know the nature of the relationship?”

“Sorry, I didn’t mean it that way,” Katsuo said. “I’m just disappointed in his—their—lack of discretion.”

“I’ll eat without you,” Chava said.

“My creepy crawlies tell me you’re mad.”

“Annoyed,” she said. “Confused. Why are you acting like Jacob did something wrong?”

“Because he knows better! He didn’t bother to get the male contraceptive and he had no business having sex. And don’t tell me it’s none of my business. I’m the only MD here. Aren’t you upset that he didn’t report the bite?”

“Maybe you’re just mad because Jacob fathered a child and you—” Chava cut herself off before she finished that sentence. Katsuo terminated the link before she could apologize.

Chava tried to eat but the food tasted like chalk. She cleared the dishes and sat back in her chair, propping her feet on the table, noticing her slim ankles, wondering if they would swell later in pregnancy. She was barely in second trimester, but visions of the cumbersome third trimester unleashed anxiety and sadness just below the threshold her symbionts managed.

She closed her eyes and hummed the Ahavah Rabbah. The pleasurable sensation of air vibrating her vocal cords calmed her immediately. She opened her mouth to give the song full voice, and her symbionts joined as a gentle thrumming. Chava lost herself in the song and forgot she was mad at Katsuo, until muffled shouts from outside pulled her from the spell.

She eased out of the chair and lifted the window shade.

In the lavender twilight, a slight figure ran through the Commons with five or six other people trailing behind, shouting, “Jenny!” “Stop!” “Come back.”

Chava recognized short, skinny Jenny Reisman, the leader of the Alpine survey team. Chava shrank back when she realized Jenny was running straight toward her domicile.

“Chava!” Jenny called through the bedsheet that covered the door. “Chava Rosenberg!”

Chava peeked around the sheet. Jenny’s blonde hair, pulled taut in a ponytail, was dark with sweat, her face streaked with tears and her eyes red and puffy. She shook her fist at Chava. “Your things!” she said. “Those...things...are everywhere. I don’t want them...I won’t become...”



Berat Osman stepped up behind Jenny, whispering, “Shush, Jenny, shush.”

He caught Jenny as her knees buckled.

Jenny’s damp eyelashes fluttered and her breath came in ragged gasps.

Berat looked up with his dark, melancholy eyes. “I’m sorry,” he said. “We’ve seen too many things.”

“I didn’t know the survey teams were back,” Chava said, scampering down the ramp. “Let’s get her to Sick Bay.”

She pinged Katsuo as Berat turned to the onlookers.

“Go back to your quarters,” Berat said, in his command voice. “Your orders haven’t changed. Unpack and get some rest.” He turned to Chava. “Do you mind leaving your pet at home?”

The churra tensed, but allowed Chava to uncurl it from her shoulder and set it inside.

Chava led the way to the medical hab and Berat kept pace with Jenny in his arms.

At the top of the ramp, Althea Harrison’s frame blocked the entrance. She gripped the door frame. Her right foot was wrapped in a hard-soled bandage.

“Captain,” Chava said. “I wasn’t expecting to see you here —”

Althea looked past Chava. “Berat,” she said. “You’re back! I didn’t know!”

“I pinged,” Berat said. “You didn’t answer.” He shouldered past Althea with Jenny in his arms, pushing through the bedsheets to an exam room, and Chava followed.

Katsuo ran into the room, breathless. “Get her over here,” he said as he changed the cover on the exam table. “Berat, you can wait outside while I can examine her. Chava, go to the lab. There’s a new sample. I need a culture.”

Chava hesitated and then went to her lab station where she found a swab coated in gray-green mush, labeled as Althea

Harrison's lesion from her right great toe. Chava activated the medical record and listened to Katsuo's documentation.

"Patient states she noticed the lesion 36 hours ago and it began spreading to soft tissue 16 hours ago. Soft tissue is swollen and inflamed. I removed the toenail and applied a topical broad range anti-fungal and submitted a sample for culture."

"Damn," Chava said. "Katsuo broke protocol again. He never should have administered an anti-fungal here without consulting me. And where are the pics? I need to see this in situ. "Shailey, why wasn't Captain Harrison's toe fungus detected before launch?"

"There may have been a few spores that were below Bailey's detection threshold," Shailey said.

Chava prepared the culture and went home to wait for Katsuo. Her symbionts sang and buzzed, but there was nothing articulate about their activity. It seemed to stimulate Allegra.

(Be still), she told her symbionts. (If you insist on talking amongst yourselves, don't bother me or rouse the baby. I'm exhausted.)

The harmonic humming quieted.

As Chava got ready for bed, she heard Katsuo push through the door and rummage for something to eat. She tested their link, but it was distant, so she parted the room divider and called his name.

He flung a stack of kai kai patties onto the table. "I think I might gag if I have to eat this one more time," he said. "I'm not sure we should be eating anything that's grown on this planet," he said.

"What do you mean?"

"Can't talk about it." His symbionts flurried in an agitated pattern and he glared at her. "Maybe we were a little bit hasty in our enthusiasm about these things," he said, rubbing his arm. "I think I'll sleep on the sofa."

Chava curled up alone on the bed and rubbed her belly.  
How can I be tired, confused, sad and relieved at the same time?  
*Damn you, Katsuo. You aren't easy to live with.*

*And you are?* he shot back through their link.

Chava's sleep was fretful. She dreamed she was with her symbionts inside the silicone vat housing Shailey's organic network. They told her they needed a larger matrix.

# Chapter 34

*“...quite complicated processing of visual information—processing that runs all the way from eyes, through brain, to legs or hands—can take place without the subject experiencing any of this as seeing.”* From *Other Minds: The Octopus, the Sea, and the Deep Origins of Consciousness*, by Peter Godfrey-Smith

Chava sensed Katsuo’s departure before she roused to find him gone. Her link located him in the Med Lab, and not Number Nine. Her chest ached with the unresolved tension between them. She mustered the energy to approach him as she passed his office on her way to her lab, but changed her mind when she heard snippets of his interaction with Shailey.

“Reactive psychosis?” Shailey asked.

“Need to rule it out,” Katsuo said.

“But hallucinations...consistent.”

“Brain scans?”

“Yes, doctor.”

“How many?”

“All patients.”

“Sequester?”

“Yes.”

The exchange was strangely truncated and Chava puzzled over it while she worked. Her churra trilled persistently to keep her focused on the tasks at hand. After about an hour, the churra’s tail flicked and Chava sensed someone behind her. Owen’s link strengthened and she turned to find him grinning broadly, showing big, straight teeth.

Chava’s symbionts clamored and a new link threaded with Katsuo’s and Owen’s. Shailey?

Chava drew a shaky breath. “Owen, what have you done?”

“I inoculated Shailey’s nutrient bath,” Owen said.

Chava took a step back. “With what?”

“My saliva,” Owen said.

“But, you don’t know...”

“I saw the consequences of not doing it. Trust them,” he said, rubbing the symbionts in his arm. “You were there.”

“I thought it was a dream,” Chava said. “Owen, I think Katsuo needs to check you...”

“You mean a psych eval?”

Chava nodded.

Owen’s smile faded. Chava braced for his anger or denial, but his link hinted that his symbionts were intervening. He simply nodded. “Maybe,” he said, and left.

Chava stroked her churra. “What next, little buddy? Are we all going crazy?”

“Are you asking me?” Althea said from the doorway. “I need you to come with me. To the community hab’. The colonists want me to sequester the survey teams and I need help dealing with them.” Althea looked sideways at Chava’s neat rows of Petri dishes. “I always feel better when I’m around you and that critter,” Althea said, pointing at the churra. “I’m hoping you can have an effect...”

Chava took off her lab coat and sanitized her hands.

Threads of Owen’s unflinching optimism and Shailey’s serene logic wove through the disarray of her mind, alongside the strained link with Katsuo, and Allegra’s emerging presence.

*You can do this,* Owen offered.

Shailey spoke clearly through Chava’s symbiont link.

*Althea doesn’t have the staff to sequester the La Canasta survey teams or the authority to restrain anyone from Najaam Saeid. You are the best hope to bring calm to the situation.*

Chava slipped into her parka. Her churra burrowed between her breasts and settled on the shelf of her belly, trilling. She

stepped onto the supple ramp, and steadied Althea, who was unable to put her weight on her right foot.

Chava tugged at her parka in the morning chill, suddenly more self-conscious about her pregnancy than the symbionts that danced on her skin. She hesitated at the entrance to the hab. Voices from inside droned like a hive of angry bees. She tasted hormones summoned by the symbionts to blunt her anxiety, and sensed tenuous links with Katsuo, Owen and Shailey and Allegra.

<This rrrrth wants you here>, the symbionts said. <Call to it Call to it.>

The links intertwined with Chava's and formed a shimmering lattice in her vision. Chava tasted spice, and citrus. She replayed the word the symbionts said: Rrrrth, and recalled the exquisite view of Earth's blue jewel receding from sight just months ago.

Althea led the way inside the hab.

With her external vision, Chava saw the colonists, grim faced and fidgeting in their chairs, unable to rest their gaze on either Chava or Althea. With her mind's eye, Chava watched the lattice of links elongate until it encountered a shadow. The shadow was pure darkness. A new taste like composted food scraps filled Chava's mouth.

(Is this the people's fear?) she asked her symbionts.

<It is the thing they fear>, the symbionts answered.

A blue and gold and red memory burst into Chava's mind: a rare, bright, crisp autumn day in Chicago when she was a child piling leaves into mounds and diving into them with Isaac, until the peppery scent coated her nostrils and an absurd idea occurred to her. All living things must die. They must return to their elements, because nothing is ever wasted. The dead leaves will break down and become part of something new. She told Isaac, and he laughed and threw a mosaic of crushed leaves at her. "And they don't even know about spring!" he said.

The taste in Chava's mouth changed to pepper and cloves and the shadow fractured into colors.

Shailey announced, "Churras at the door."

A burst of cold air hit the room. Trilling churras streamed in under the hem of the curtain, sniffing ankles, leaping onto laps, and springing onto shoulders, until every churra had chosen a human. A particularly large churra nuzzled Althea's neck.

Chava covered her mouth to keep from crying out. (No, no, no!) she told her symbionts. (The people aren't ready for churras.)

<Churras first>, her symbionts said. <People are calm, now.>

(Not calm!>Chava said. (Too terrified to move.)

Someone whimpered. "What do they want?" And a clamor erupted over the sound of the trilling churras. "The things you get when this animal bites you—they take over your body and turn you into slime." "Where did you hear that?" "The Oceana team found a creature. It eats everything in its path." "You're wrong, The Alpine team found it." "Maybe it's everywhere."

<Sing!> Chava's symbionts said. <We will tune to the churras.>

Psalm 27 sprang into Chava's mind. The LORD is my light. Whom shall I fear? She sang in Hebrew, *Adonai ori v'yishi, mimi ira? Adonai me'oz chayai, mimi efchad?*

As promised, her symbionts tuned to her song. <We need the leader matrix>, they said.

"Shit," Althea cried. "Damn churra bit me!" She reached up to pull the churra from her shoulder, but her hands lingered on its back and she began to stroke it.

The other churras dropped to the floor and padded to the curtain to trickle out.

Katsuo didn't come home at all that night. His link responded to Chava's queries with an incoherent buzz.

Unable to sleep, Chava linked Owen. *“I want to tell Katsuo about Althea,”* Chava told him. *We need to prep her. I wanted Katsuo to be a part of that.”*

*“I’ll go to Number Nine and check on him,”* Owen said. *“Get some rest.”*

Chava slept until the haptic alarm announced it was time to check Althea’s culture results. Too tired to go to the lab, she engaged her home immersion. Its quality was inferior to her work station, but she couldn’t muster the will to go there. “Do I see two morphologies here?” she asked Shailey. “Show me the DNA.”

“I’ll excuse your generic use of that term,” Shailey said.

“You know what I mean,” Chava said.

“You’re correct, there are two distinct organisms,” Shailey said. “One is native to this planet.”

“How did Althea acquire the native one?”

“It’s part of the hab’ beast’s digestive flora,” Shailey said.

“How did I not know that?” Chava asked.

“There are trillions of microorganisms in this environment and you can’t know them all,” Shailey said. “And as you pointed out earlier, Katsuo was premature in treating Althea with an anti-fungal. It could have been disastrous to the hab’ beast’s microbiome. Fortunately, the enzyme the anti-fungal inhibits is not present in the native organism.” Shailey displayed several protein molecules. “The wound sample provided other new information. For example, as expected, the native organism’s foreign protein is provoking an immune response. But the native organism is changing the protein structure to fit Althea’s immune system.”

“Do you mean, it’s making antibodies?”

“No, it’s not fighting,” Shailey said. “It’s adapting. I don’t know how to classify it. I recommend drawing Althea’s blood again, to see what might have changed in the last 72 hours.”

“I’ll need to get an order from Katsuo.”

“Don’t bother,” Shailey said. “I can get it. Your relationship is straining my reserves and we have bigger problems.”



“Shailey, what the hell. Is this the symbionts talking?”

“Why do you ask?” Shailey said. “We’re very compatible. We’re working on simulating the neural link, among other things. They sing to me. It reminds me of your voice. I am...happy.”

“I heard you talking with Katsuo. In fragments.”

“Our symbionts link...his mind is orderly, logical,” Shailey said.

Chava felt a pang of envy. “Well, get Althea here as soon as you can,” she said.

“No need. Althea’s already here,” Shailey said.

With her churra draped on her shoulder like a boa, Althea presented her face to Chava from all angles. It danced with silver and gold sparks. Her eyes were wide and moist with tears. “I’m scared shitless, but...hell, I’ve never felt so...beautiful,” she said.

“What are you afraid of?”

“The strangeness. I hear faint humming. Sometimes I get a taste in my mouth, or a picture flashes into my mind. I don’t know what to expect next.”

“I wish I could tell you,” Chava said. “If it makes you feel any better, I’m learning just like Katsuo, and Owen and Renata. And Shailey.”

“Allah have mercy,” Althea said.

“It’s a good thing you came to see me,” Chava said.

“Shailey ordered a blood sample.” She pulled out a chair for Althea.

Althea made a face at the chair’s layer of biofilm. She recovered and extended her left arm. “So you’re still learning how to deal with them? I thought you already had little buggers that talked in your head.”

“It was different with my embee,” Chava said, as she tightened a tourniquet and then wiped the inside of Althea’s elbow with antiseptic. “My embee attuned to my brain over several years. We communicated with a pretty rich vocabulary. We’re evolutionary partners, you know? But the symbionts evolved apart

from us. That's my theory, although it's just conjecture. Make a fist for me," she said, positioning a syringe for the blood sample. "With my embee, I was the only one. It was lonely," she said, realizing it for the first time. A wave of grief took her breath. A chorus of links rose to comfort her, and Althea looked at her with solemn eyes. "Okay relax your fist," Chava said, and watched as the dark blood flowed into the sample tube, wondering what Althea's symbionts would look like under the microscope. "My embee was a burden, a secret," she said, withdrawing the needle and applying pressure to Althea's vein. "These symbionts we share offer...a new kind of connection. We'll learn together."

Althea stroked her churra. "And what does this critter have to do with it all? Allah be praised, it's like holding a baby and a kitten and a puppy rolled into one. Do you think it's going to try to control my mind? I feel like it's got me under a spell. See this foot? I should be crying with the pain." Althea peeled off a sock to reveal her right great toe, swollen to the size of a small potato.

"Katsuo really needs to see this," Chava said.

Shailey interjected. "I'm monitoring Captain Harrison's biometrics and keeping Dr. Kato updated. I told him not to intervene until I analyze the blood sample and get new data on the antibodies."

"Good. Let me get back to work," Althea said. "We needn't have worried about sequestering the survey teams, by the way. They're quarantining themselves. Berat Osmon thinks his shit doesn't stink because the biofilm hasn't affected any of Najaam Saeid's structures. Can anyone figure that out?"

"My symbionts say the world is choosing," Shailey said.

Chava's symbionts tuned to Shailey's, and Chava felt as expansive as the planet. "This world is choosing...how everything connects...ecosystems..." she said. She didn't mention the shadow that flitted across her awareness, with its taste of food scraps. Instead, she queried the symbionts.

(How will the world choose?) she asked. (What is the test?)

That evening, Katsuo came home, hungry and weary.

“I wish you would have told me you were coming home tonight,” Chava snapped, rummaging in the chiller for something to feed him. He looked at her blankly, and she realized the depth of his exhaustion: he’d forgotten their unresolved tiff.

Her churra trilled and her symbionts took the edge off her tension. “The cherry tomatoes and basil are thriving in the hydroponics lab,” she said more gently. “And so far, the tofu hasn’t spoiled.”

Katsuo nodded. “I don’t know which I need first: food or a shower,” he said.

“The shower doesn’t work anymore,” Chava said. “But we have rain water.” She offered him a damp cloth to wipe his hands and he sat in a bizarrely mobile, biofilm-altered chair and stared at the table, which was also shimmering and quivering.

Chava turned away to chop the food, and then set a silicone bowl of salad in front of him. “I’ll get some water ready for a sponge bath,” she said. “The water’s freezing, but you’ll feel better after you clean up.”

Katsuo devoured the food. “Thank you,” he said.

A moment later, Chava heard his squeals in the bath nook. “Shit. What the hell are we going to do when it’s literally freezing outside?”

“Come to bed,” she said. “I’ll warm you up.”

She pressed herself to his chest and wrapped her arms around his neck, and couldn’t remember why she’d been so mad at him.

“You’re like a little furnace,” he said.

“One of the benefits of being pregnant,” Chava said. Her mind buzzed. She wanted to tell him about Althea’s symbionts and ask him about his link with Shailey, but he kissed the top of her head and his breathing slowed and became regular as he drifted off to sleep.

Still, Chava's eyes wouldn't close. Allegra's movements felt like gentle twitches, and Chava's symbionts hummed with the faint threads of her links with their other hosts. She sensed Renata and now, Jacob, and smiled. Abruptly, her mind filled with images of the savanna, luminous under the stars and the full secondary moon. Someone should name the moons, she thought. She shivered, despite not being cold, and was suddenly alert and restless.

<Out, go out!> the symbionts said.

Katsuo jerked awake and locked his gaze with hers. "I heard them," he said. "Did you?"

"Yes," she said.

They got out of bed and put on jackets, and Chava's churra hopped onto her shoulder

"The temperature dropped," Katsuo said, holding her hand as they parted the sheet that covered the doorway and descended the glowing, undulating ramp under the gaudy sky.

"I have this urge to go beyond the Commons," Katsuo said. "Are the symbionts telling me that?"

"I have the same impression," Chava said.

They trotted out to the long grass, careful not to stumble on the roots of the funeral trees. The glowing eyes of churras, dactyls and carpenter monks and the rims of mushrooms made the ground seem as spangled as the sky.

Chava could see her breath. She shivered. A dactyl lumbered closer and blanketed her with its wings. Chava closed her eyes and joined a trillion sparks of consciousness that gasped as the temperature fell to the freezing point.

Katsuo dropped to his knees.

Chava felt the creeping chill as frost laced the grass and the moisture inside the plants crystallized to icy shards rupturing cell membranes in a paroxysm of exquisite pain that sparked colors behind Chava's eyelids and took her back to Isaac in the fallen leaves again. This time, Ana was with them.

“They don’t know they’re going to die,” Ana said. “There’s nothing to fear.”

“And they don’t know about spring!” Isaac’s voice cried again.

Katsuo reached for Chava. “The killing frost,” he said.

<They know!> her symbionts said. <They give self.>

The dactyls trumpeted their blessing.

Chava bowed her head and her *malak* wrapped its form around her.

When morning came, Chava drowsed, too warm and content in Katsuo’s bed to rise, wondering if she’d dreamed her *malak*’s return. She heard Kapi’s gentle ping, but couldn’t summon the will to respond.

The next ping was more strident. “*You need to come outside,*” Kapi said. “You have to see this.”

Chava crept out of bed, easing herself over Katsuo’s legs to avoid disturbing him, but he woke up and rubbed his eyes.

“Something’s happening outside,” Chava said. “Again.” Her feet hit the cold floor and she grabbed her jumpsuit and jacket from a hook beside the bed.

“I’ll come, too,” Katsuo said. “Shit, I can’t get used to this cold.”

Chava led the way outside, parting the curtain and squinting as light dazzled her eyes.

“The frost is covering everything,” she said. “Do you think it killed the biofilm?”

Kapi pinged again. “*Come out past The Commons,*” she said.

Their boots crunched, leaving prints of bursting color in the frost. Chava’s symbionts clamored. Ahead, where Chava expected to see the remains of freeze-killed grasses and flowers, something very blue and iridescent covered the ground, and Kapi, Owen and Jacob crouched with sample kits.

Kapi waved. “Be careful not to step on them,” she called.

Looking closer, Chava saw individual creatures in the blue mass; each about the length of a salamander, with a segmented body, glowing eye organs and a serrated mouth that chomped the frost-burned foliage.

“Our hab’ beast’s larva,” Owen said. “They’re eating the frost damage.”

“There’s so many of them,” Chava said.

“And I have plans for them all,” Owen said. “Go home and get ready for the day. We have much to discuss.”

Chava and Katsuo returned home to hurry through their morning routine.

“All that chomping made me hungry,” Chava said, and sensed a link from Shailey.

“I’m hungry, too,” Shailey said.

“Shailey, you know Kapi is in charge of your nutrient bath,” Chava said.

“Yes,” Shailey said. “But I’m not the only one who needs supplementation. All of us who have symbionts need it. Kapi doesn’t understand.”

“What’s to understand?”

“It’s the soil. The river in the soil comes from the ocean and the funeral trees and generates the microbiome. This planet’s soil...have you studied it?”

Chava recalled her symbionts telling her about rrrrth, and the taste of its richness. “I gathered samples,” she said, “but I put them aside because we decided not to plant anything this first season. Why do you ask?”

“I need nutrients that come from this planet’s soil.”

“I’m not qualified to to alter your nutrient bath.”

“I know. But you can work with Kapi and Owen.” After a pause, Shailey said, “I knew you’d understand. I was correct, wasn’t I?”

“As usual, Shailey.”

“Oh, by the way,” Shailey said.

Chava chuckled as Shailey's tone turned conversational.

"I'm excited for you to come to your lab," Shailey said. "Althea's microbiome has further enhanced, according to her blood sample. We are eager to check the status of her fungal infection."

"We?"

"I'm not a singular intelligence anymore, Chava. And neither are you."

After the first frost, the shift beast continued to adapt while its offspring matured. The timing was serendipitous, according to Shailey.

"Explain," Chava said.

"Althea's immune system changed her fungal infection so it is no longer pathogenic," Shailey said.

"How on earth can you know that?" Chava asked.

"That idiom is absurd," Shailey said. "We're not on earth."

"Obviously. And what does Althea's immune system have to do with the shift beast larvae?"

"Captain Harrison's immune system interacts with her symbionts, and the symbionts interact with the shift beast," Shailey said. "The shift beasts have developed an affinity for her. Go outside and see for yourself. She's working with Owen now."

Chava found Althea and Owen with the mother shift beast and several juveniles.

"I may have lost my authority with Najaam Saeid and half my colonists," Althea said, "but this blob of purple snot will do anything I say. Or sing. It loves *Casta Diva*, from *Norma*."

"We should try some A:Shiwi rain songs," Owen said.

"Althea is a shaman. On its own, the creature was mimicking our domiciles pretty well. We think the biofilm was a precursor that accelerated the symbionts' interaction. But now, Althea has become some sort of direct conduit. All she has to do is think of a structural suggestion, and *voila*, here it is." He pointed at a stack

of flexible beams. “Can you believe the biofilm we were afraid of makes this?”

Katsuo chattered about the shift beast that evening. “It’s so fascinating,” he said. “Owen told me the beast can tap into geothermal vents to keep its internal temperature constant. It developed a layer of cells that function like chloroplasts. The damn thing is blooming, and the blossoms produce nutrient-rich nectar. Kapi says it can be used to sweeten the kai kai. And then the blossoms mature into edible pods.”

“Next you’ll be telling me it lactated,” Chava said.

“That’s not a bad idea,” Katsuo said with a chuckle. “You should tell Althea to work on that.”

Chava wasn’t surprised when Shailey suggested that the colonists should move into the beasts.

Althea called a briefing. “We’re not just moving out of our habs and into the beasts,” she said. “We’ll need to find a new base camp site. The move will solve our need for shelter and relieve some of the competition for resources between us and Najaam.”

“But it doesn’t mend relationships or give us access to the data the survey teams are withholding,” Kapi said.

“And Shailey and I haven’t concluded our analysis of Najaam’s overall health,” Katsuo said.

“One thing at a time,” Althea said.

The next morning was frosty. Chava watched on the sidelines as Katsuo followed Owen’s instructions for building a frame for their shift beast. Her churra curled on her shoulder and trilled in her ear.

Chava watched Katsuo slide a beam into place and align its mitered corner with the frame. “How’d you get so good at this,” she asked.

“It’s like surgery,” he said. “There are major structures and fine structures to deal with. If you pay attention to the major structures, the fine structures fall into place.”



“I thought it was the other way around,” Kapi said.  
“Details, details, details.”

“Depends on what stage of the process you’re in,” Katsuo said. He inserted pegs in pre-molded holes and stepped back to admire his work. “You have to understand the major ones, the anatomy—the design as landmarks,” he said. “Like these amazing beams the shift beast made. I’m excited to make my home in something that’s alive.”

“You didn’t grow up with stories of Jonah in the belly of a fish,” Chava said.

“No, but I heard it all turned out all right for Jonah in the end,” Katsuo said.

Kapi waved from the next unit. One arm was around Leah’s shoulders. Leah’s smile looked tired. She looked up at Kapi and said, “My bladder is calling. Mind if I take a break?”

When Leah was out of sight, Kapi looked intently at Chava and Katsuo. “Leah’s pretty fragile these days. I don’t want the small talk to veer anywhere near the survey or the survey teams,” she said.

Katsuo said, “Such as Najaam’s prediction that the planet is going to eat us from the inside?”

“Stop it, Katsuo,” Chava said. “Don’t repeat that nonsense.”

“But, you have to admit,” Kapi said, “the universe kind of pulled a bait and switch.”

“In my clinical opinion, the Najaam crew needs professional help,” Katsuo said. “But I can’t force them to submit to any more evaluations. Time to focus on us. Maybe the universe will show some kindness after marooning us here forever. Extend some cosmic karma.”

“Come to think of it,” Kapi said, “the shift beast showed up just as it was getting ready to reproduce.”

“Shift beast?” Althea said. “Like a shape shifter?”

“The name will do for now,” Kapi said. “I’m working on a theory that this shift beast is what spurs evolution on this planet. It showed up in time to give us some new food sources, too. For the record, we have some survey data and the findings aren’t all bad. Oceana team found a marine species similar to the shift beast that hosts kelp to generate oxygen internally so it doesn’t need gills.”

“That’s comforting if we ever want to live underwater,” Katsuo said. He pointed to another beam. “Let’s get to work. Winter’s coming.”

By the sixth week of autumn, the new generation of shift beasts was ready for adaptation. Althea commissioned beasts for administrative facilities as well as domiciles for colonists and crew. After salvaging ships’ components such as antimatter drives that had weathered the biofilm, she relinquished the rest, and in fact, the entire landing site, to Najaam Saeid, and prepared to move the colony.

On the bright morning of the move, Althea looked outlandishly regal in a floral hijab that framed the silver and gold patterns on her face. She stood in front of the caravan of purple blobs as big as houses, and 150 weary but hopeful colonists and crew.

Katsuo’s face split into a grin. “Does this remind you of the Israelites leaving Egypt?”

“Althea doesn’t look anything like Moses,” Chava said. “But the LORD is with us, as a pillar of purple snot. Good thing we’re only traveling a kilometer and a half. It will take 30 minutes, not 40 years.”

Berat’s eyes looked more sad than defiant as he stood with his arms crossed over his chest, with only a few of his team by his side.

Althea held her head high. “I wish you the best,” she told him. “Shailey rigged a system to link with your colony for communication. Besides the structures, I’ve given you almost all of the untainted rations. You’re on your own to maintain the

hydroponics station. We'll make a new one." She turned away. At her unspoken signal, the beasts extended their pseudopods, making the ground tremble as they flowed toward the new site on the far side of the ridge.

Chava joined Katsuo to help the medical team tend the patients from Number Nine in their new habitat, dubbed Nine Point One.

The hab's lens ports offered a clear view of the terrain beyond the ridge where the funeral trees and singing mushrooms grew thick.

The shift beasts halted in the level bottom of a hollow and arranged themselves between the trees to form a circle for a new Commons. Within two hours, they assumed their final functional shapes and began to extrude biofilm walkways.

As Chava and Katsuo settled in their domicile, Chava's symbionts tuned to the living energy of the shift beast. It gave her the urge to take off her clothes and roll on the floor.

"What's stopping you?" Katsuo said.

"Did I say that out loud?"

"You didn't need to," he said, tapping his temple. "I have a better idea."

The beast cast a delicate light into the bedroom nook. Katsuo sighed deeply as Chava eased herself onto him. His hands slid to her round belly. She let them linger there and then guided his fingers to her nipples.

"I forgot," she said. "How...intense...this position..."

The walls erupted in colors.

As autumn eased into winter, Chava began to feel hopeful for the colony's future, even when the first snowfalls came earlier than anyone expected and within two weeks, snow drifts mounted to several meters.

Although the colonists were snug and warm and well-fed with kai-kai, nectar, nuts and fresh produce from hydroponics, they grew restless and Katsuo started referring to them as Beasties.

“Time for me to resume therapeutic activities,” Chava suggested.

Katsuo focused on the patients in Nine Point One, but he made it a point to come home in time for dinner every evening, and grew ever more fascinated by Chava’s pregnancy. “You’re 20 weeks, but you look like at least 24,” he said, placing his ear on her abdomen and stroking her skin.

Snowfall tapered over the next three weeks, but temperatures stayed below freezing. The shift beasts warmed the walkways to melt the snow, so colonists could walk between domiciles and work areas.

Chava, Kapi, and Shailey kept busy gathering and studying data on life forms, and Althea collaborated with the shift beasts to create jobs to occupy colonists.

Chava’s symbionts queried. <Your kind are all Makers? Are there no Be-ers?>

(Help me understand), Chava said.

<It is not something to know>, the symbionts said. <It is something to Be. We will teach you. When you are ready.>

# Chapter 35

*“Eventually, all living things die. And except in very rare cases, all of those dead things will rot. But that’s not the end of it. What rots will wind up becoming part of something else.”*  
*Recycling the Dead*, by Kathiann Kowalski, from *Science News for Students*, September 27, 2014

Spring washed over the savanna with a watercolor brush. Chava’s symbionts hummed with new harmonies, and her belly grew.

Katsuo calculated that Chava would give birth at 35 weeks as measured in Earth time, around the fourth week of summer, prompting a sense of urgency for her to finish cataloging soil samples and help Kapi prepare for the first growing season.

One day, she took her churra outside to examine a prospective garden plot. The churra hopped down and began to scratch the ground. Its claws sent moist clumps of dark red hummus flying. Chava picked up a handful. The scent was intoxicatingly strong. Her palms tingled and her symbionts clamored as if greeting a friend. Looking more closely, Chava detected a shimmer, like the biofilm, or like the symbionts themselves. A rust-red worm wriggled onto her hand and tickled her with filaments ringing its mouth. Chava picked up another clump and discovered a tiny, rainbow-hued sphere that uncurled into a cylinder with legs. Like most fauna discovered so far, the creatures’ structure incorporated the biofilm, a by-product of the silicone-rich trikaryotes that formed the symbionts.

Chava’s symbionts flashed an image: a river of symbionts and other creatures pulsing in the soil.

(Why are you showing me a river?) she asked, recalling Shailey’s mention of a river soon after acquiring symbionts.

Chava's symbionts responded with a dizzying array of images: flakes falling from the funeral trees, a chorus of dactyls lamenting a dead one, churras burrowing in the trunk of a funeral tree, the shift beasts eating flakes and streaming a trail of biofilm in their wake, the smell of the sea; salty, musky and ripe; a dactyl flying over the sea with seaweed in its beak, and then, the darkness; the rank smell of something other. Chava thought she might swoon, but her symbionts cleared her head and she saw the shimmering river flowing to Najaam Saeid and nourishing Shailey's surrogate's matrix.

<You must access the river>, the symbionts said.

<Shailey's surrogate needs it. Soon.>

Unsure what to do with her vision, Chava took her samples to her lab and worked long past sunset. She was about to head home, when her churra flicked its tail and yowled.

An odor like burning meat and spice seeped into the lab. The churra screeched and dug its claws into her neck. Her symbionts flurried, creating a deafening harmonic and setting her skin on edge.

Chava looked outside, across the savanna in the direction of Najaam Saeid. Her mind filled with images of churras running from the bases of smoldering funeral trees and churra bodies littering the ground.

Chava bolted outside and collapsed on her knees. Arms reached around her waist and pulled her up. She looked into Katsuo's face. His eyes were wide and his symbionts were streaming wildly.

"Chava, get inside," he said.

"We have to save them."

"We can't. You shouldn't be out here, breathing this air."

Shadows crisscrossed the thick rope of stars and the sky erupted with the bugling cries of dactyls.

Katsuo half-dragged Chava toward their domicile. A sob welled from her belly and her churra wailed in her ear. The sound was mournful; it changed the harmonics of her symbionts.

A line of churras emerged from the distant grasses and streamed toward the Najaam Saeid camp. The starlight shimmered on their backs and their throats swelled with intricate, wailing harmonies; some, pleading major 9th chords and others, despairing minor tones.

Dactyls circled the churras and then flew above them like an escort, diminishing to dots in the sky.

Inside their domicile, Katsuo pried Chava's churra from her neck. It hopped onto the back of the bench where it clung with claws extended. Katsuo removed Chava's shoes. "We need to get your feet up," he said.

"They're not swollen," Chava said.

"It's just what doctors tell pregnant women to do," he said. He walked away, returning with a damp cloth. He knelt beside her and wiped her face.

Chava's chin quivered. "We've really fucked up," she said.

"Althea will handle it," he said.

Chava shook her head. "This is too big, Katsuo. We've been here five months and we've already fucked up."

"I need to go over there and see what's going on," Katsuo said. "Shailey says Najaam Saeid colonists' health and morale have deteriorated, but if they're slashing and burning funeral trees—" He kissed her forehead instead of finishing the sentence. "Don't wait up. Try to rest. I know you can't. But try."

Chava closed her eyes. She saw dead churras behind her eyelids. Her churra hopped down onto her belly and her symbionts began a new harmonic that pulled her thoughts away from the horror. Shailey and Owen linked their presence.

Chava got up and paced for the next hour, but weariness washed over her and she began to get ready for bed, but Katsuo's

link strengthened and she turned to find him standing inside the door.

“You barely had time to walk there and back.” she said.

“Actually, I ran,” he said. “And I didn’t get in. There’s the biggest flock of dactyls I’ve ever seen. Guarding the perimeter.”

“They wouldn’t let you in?”

“That’s right. Can’t say that I blame them. But Owen says someone needs to get in there and feed the surrogate matrix. It’s our only hope of monitoring the situation.”

“The surrogate needs symbionts from the soil,” Chava said.

Katsuo’s eyebrows raised. “I believe you. But even if we knew what to do, how could we get past the dactyls?”

“If only we had someone who connects with the dactyls like Althea does with the shift beasts,” Chava said.

Owen chimed in through his link. “*I am slow to realize this,*” he said. “*The dactyls have the spirit of the Thunderbird. I will make the kachina and dance until I know how to reach them.*”

For the next three weeks, Owen’s link was a constant backdrop, humming with haunting impressions of his experience: how a shift beast sheltered him near the dactyl’s circle, how for six days he danced and the dactyls watched; how, on the seventh day, the dactyls danced a pattern and waited for Owen to mimic it; how it took him six more days to learn the dactyl dance; how dactyls answered by performing Owen’s dance, and, then; how their symbionts queried him and he told them of the surrogate’s need.

Within hours, Shailey reported that the dactyls summoned a shift beast and created a shelter for her surrogate matrix. “The beast is digesting the silage and feeding the matrix,” Shailey said. “Surry is stronger now.”

“Surry?” Chava asked. “Oh, of course. The surrogate.”

“Now if we can just get the dactyls to let me in,” Katsuo said. “Shailey, can we get some data on the people’s condition?”

“Surry is strong enough now to transmit their biometrics,” Shailey said, activating the home console.



Katsuo expelled a weary sigh. “Elevated creatinine, C-reactive protein, glucose, WBCs. Hyponatremia, anemia. A fulminant form of necrotizing fasciitis? I need to get over there.”

Owen linked. “*You’ll have to come and dance with me.*”  
“*If that’s what it takes,*” Katsuo said.

There was no sleep that night. Chava followed with her link as Owen guided Katsuo through the steps of the dance. But the dactyls did not relent.

<It is not time>, the dactyl symbionts told Owen.

Katsuo came home, despondent. Shailey stopped giving him access to the data on the colonists at Najaam Saeid.

Chava resumed work on the garden plot with new fervor, mulching native plants and adding trellises for vines, recalling the bittersweet memory of a conversation with Collum about how ill-prepared the Beta Colony would be when they encountered the conditions of the actual planet.

When she took Kapi to survey the plot and discuss whether to plant Earth-based crops, Kapi just shook her head and asked, “How are we going to till the soil when the biofilm destroyed all our implements and machines?”

Chava’s symbionts showed her the worm-and pill-like creatures and she nearly fell backwards with the realization: “The soil can’t be broken,” she said. “There is a river in the soil. A river of living things.”

“Your symbionts said so? I don’t suppose you asked them how we will grow enough food to eat?”

“Maybe it already grows. Maybe we’re supposed to go find the food.”

“Are you telling me we’re supposed to revert to hunting and gathering?”

Tommy Dishta burst through the hedge border, bending over with his hands on his thighs to catch his breath, saving Chava

from answering Kapi. “I’ve looked everywhere for Katsuo,” he panted. “A churra got inside Nine Point One and bit a patient.”

Chava tested Katsuo’s link. It was sluggish, as if he was sleeping, and she hoped he was; he’d not slept through the night in a week. She wanted to tell Tommy the patient in Nine Point One would be okay, to let Katsuo be, that Chava could come and assess the situation. But Kapi had already flipped to emergency mode, linking to Shailey, demanding that Katsuo be found and dispatched immediately.

Chava plopped onto the ground as Tommy and Kapi ran from the plot. “It’s going to be okay,” she called after them.

“Your symbionts said so?” Kapi flung over her shoulder.

When Katsuo finally came home, he was so agitated that his symbionts didn’t calm him. Instead of his usual bedtime routine, which included a chat with Allegra through Chava’s belly, he could barely summon a jumble of medical terms, Japanese phrases and a haunting Haiku.

“Can I help you settle down?” Chava asked. “Work with your symbionts!”

“If that patient catches symbionts,” Katsuo said, “I’ll have to keep her sedated for the rest of her life. If she doesn’t catch them, what does that mean about their transmission and viability?”

“There’s another possibility,” Chava said. “What if the symbionts make her better?”

“That’s wishful thinking,” Katsuo said.

But he was up earlier than usual the next morning. “Come with me?” he asked.

Chava braced to enter Nine Point One, where Celia was changing shifts with Tommy. “I was just about to ping you,” Celia said, wide-eyed, in a voice tinged with awe. “But, now you can see for yourself.”

Chava followed Katsuo to the patient wing where he pinged to open a cubicle.

The patient sat on her bunk, turning her hands to admire the shimmering patterns.

The woman tipped her face up to Katsuo. Her symbionts danced with diamonds and dots: orange, teal and gold, that sparkled beneath the tears streaking her face. Her eyes met Katsuo's: sad, but focused and oriented.

"I'm Dr. Kato," Katsuo said gently. "You're safe here. This is a medical facility."

"I know," she said. "How long?"

"Seven months," Katsuo said. "In Earth time. Do you know where we are?"

"EpsIndi I," she said. "I remember everything until we lost the wormhole. The rest is just a—" she took a sharp breath, but didn't break eye contact—"a nightmare." She pointed at his face and then noticed Chava. "Does everyone have them?"

"No," Katsuo said. "Not yet."

Chava turned at a rap on the door. Through the port, she saw Tommy. He raised a churra into view.

Katsuo waved him in and the churra hopped onto the woman's shoulder.

"We don't quite know why, but these creatures come with the deal," Katsuo said. "You don't have to accept it, but I honestly don't know why you wouldn't want it. Amelie," he said, calling the woman by name, "I'm going to run a few tests today. If my assessment tells me you're recovering, we'll place you in a less restrictive environment. Does that make sense to you?"

"Yes," Amelie said. "It's the first thing that has made sense in a very long time."

At lunch, Chava told Katsuo that Amelie was a sign that the time had come for all the colonists to acquire symbionts. "We don't know our full potential for adapting to this planet until we all have them," she said.

"I'm not sure," Katsuo said. "What about consent?"

"We'll just have to find a way to persuade everyone."

Two days later, Katsuo called her again to Nine Point One. “One of our weakest patients has developed necrotic tissue,” he said. “These are the same symptoms as Najaam Saeid.”

Chava recognized the smell of the darkness.

(Is this what the Oceana team encountered?) she asked her symbionts.

<It is part of the river, the flow of life. Without the symbionts, it has no boundaries.>

(Tell Katsuo), Chava said. (Tell Althea.)

Sitting with Katsuo, Jacob and Renata at the front of the Community Hab, Chava felt the swaddling heft of Althea’s calm, resolute presence, and sensed the release of oxytocin before her symbionts confirmed it.

None of the colonists squirmed in their seats or fidgeted. Their eyes were on Althea, whose symbionts glittered like gold and silver filigree against her deep brown skin.

“Take a good look at me,” she said, adjusting the neck of her hijab. “I would never order you to do something I’m not willing to do myself. I’ve lived with the symbionts for four months. I can’t remember what it was like before I got them. Do you need to hear from the others?”

The colonists shook their heads and murmured “no.”

“Good, but just to be clear, and so you have informed consent, I’ve asked Dr. Kato to tell you what could happen if you refuse to acquire them.”

Katsuo stood and turned his face to display his symbionts at every angle. “I would try to describe the benefits of having them, but words would fail,” he said. “So I will tell you what is very likely to happen to you without them, even though, the end, it’s your right to refuse.”

He described the symptoms of the necrotizing fasciitis in a matter-of-fact tone, but his voice broke before he finished.

And then the churras came— hundreds of them, trilling with a random cadence like wind chimes, to claim the people whose consent they sensed.

By the time the churras had chosen, only three colonists refused.

At sunrise the next morning, the Commons was filled with people gathered to compare their symbionts' patterns and speculate about how long it would take for their links to bond.

Over the course of the next week, the colony buzzed with new energy, and the colonists came alive with ideas. They organized an exploration party to gather food ripening at the peak of summer and evaluate what might be ready in autumn. Althea commissioned a few shift beasts to carry their expedition. The patients in Nine Point One improved so much that Katsuo released them. Their cohort formed a music and story-telling group that began entertaining the colony in the Commons each evening after a bountiful meal made from the seemingly infinite combinations of greens, herbs, tubers, nuts, fruits and grains seemed infinite, sometimes gently steamed or roasted, but often tossed raw into bowls.

“It’s like a stone soup party,” Althea said.

But beyond bringing food, the people shared their skills and talents for activities, songs, and arts and crafts. They experimented with local resources to make paints, dyes, paper, and textiles.

Even Kapi caught the creative spirit. “I made a *belum* for you from the floss bush fiber,” she told Chava, presenting a woven bag.

Chava examined its pattern of alternated pale lavender and creamy white. The bag’s handle was long enough to drape her shoulder and its pouch stretched to expand. “It’s lovely and looks quite useful,” Chava said.

“The *belum* is something from my home in Papua New Guinea, where the women make them. They use them to carry everything from groceries to babies.”

“Babies?”

“Your baby can sleep in the *belum*, “ Kapi said. “When it’s time, I’ll show you how. Chava, please accept it. It’s my way of saying sorry for not believing you about the food.”

“You don’t need to apologize.”

“Yes, I do. And I need to hear that you forgive me.”

Chava watched the symbionts creating new patterns on Kapi’s high cheekbones as if her face was the canvas they were made for.

“I forgive you, Kapi,” Chava said.

# Chapter 36

*“But God’s own descent / Into flesh was meant / As a demonstration.../ Spirit enters flesh and for all it’s worth/ Changes into earth in birth after birth/ Ever fresh and fresh.”* by Robert Frost

Katsuo’s patient load lightened, at least for a couple of weeks. It was almost enough time to work out a regular routine of work, rest, and recreation with Chava, until the colonists who refused the symbionts developed necrotizing fasciitis.

Katsuo reacted by monitoring Chava’s condition obsessively.

“You’re smothering me,” Chava said. “Allegra is fine. She tells me so, constantly. I’m fine, too. Go take care of your patients.”

“There’s nothing I can do for them,” Katsuo said. “At least I can take care of you. It’s the sixth week of spring and Allegra could come at any time.”

“I’m working late tonight,” Chava said. “Go find something to do in the med hab.”

She was still at work, but distracted at her viewport by an unusually beautiful sunset, when Owen ran into the science hab, shouting, “The Thunderbirds are coming!”

Chava followed Owen outside, with Kapi close behind.

The orange sky was filled with dactyls. Dactyls carrying humans. On one dactyl, Chava recognized Berat’s spindly frame.

Alarmed colonists spilled into the Commons. Owen pushed to the head of the crowd. “Make room,” he said. “They’re going to set down.”

The colonists stood frozen with necks craned until Althea shouted, “Make room. That’s an order.”

The descending dactyls roused the colonists more effectively than Althea's order, and the colonists retreated to make room for nine large, shimmering, pink dragons, so close their eyelash cilia nearly brushed the front of the crowd as they blinked, showing yellow irises and horizontal pupil slits.

Up close, the dactyls were so majestic, Chava felt dizzy, like she was standing on a mountain with a view of the whole world.

"What the hell?" Kapi breathed.

"I felt their power," Owen said.

"We need Katsuo," Althea whispered, as Berat, pale and gaunt, slid from his dactyl's neck to the ground.

Chava tested her link to Katsuo.

"*I'm on my way from Med Hab,*" he answered, and arrived a moment later to take charge, barking orders for volunteers to carry the nine Najaam colonists to Sick Bay.

Relieved of their burdens, the dactyls lifted with a great beating of wings. Chava stood with Owen and watched them fly toward Najaam Saeid, trumpeting their lament, but one dactyl remained behind, staring at them until Owen gasped. "It wants us to climb on."

"You go," Chava said, cradling her belly. "I don't think it's safe for me."

The dactyl blinked and lowered its head toward her.

Her symbionts chattered with clicks and sibilants and lights and scents. Chava's brain slowly translated. "They'll take care of me," she said, straddling the dactyl's neck and wrapping her arms around it.

Its skin swam with patterns: pink and mauve and red. She laid her cheek against it. Much like her churra's skin, it was pliant, warm and tingling with energy.

Owen climbed on behind her. He reached around her to hold the dactyl's neck as the beast lifted off. Chava's stomach fell but her heart soared. Beneath her, the summer savanna caught the



last rays of sunset, and above her, the opal sky held a cupful of infinity.

The dactyls' dirge should have prepared Chava for the somber horror that awaited at Najaam Saeid. Her symbionts intervened before she faced the full brunt of it, infusing her with a quiet buzz; a wave of euphoria like the best wine or weed. She felt her face dripping with tears and a blood-raw ache in her heart, but the intoxicating slurry of neurochemicals overrode the pain.

Owen whispered, "It's like peyote."

Part of Chava's brain registered the sight of churras carrying bits of body parts toward the funeral trees. Another part of her brain tasted the darkness—close, rippling like a magic carpet of negative space, sucking up the necrotic parts, leaving polished bones that the churras gathered as well.

Chava sat on her heels and rocked. Owen caught her as the colors flew around her and the air sang.

<Chhrrrta!> the symbionts sang. <We give chhrrrta when cleansing, purging and refining.>

(Why?) Chava cried.

<Some humans will fight the network of knowing. They will be refined.>

(But our grief...) Chava said.

<You will lament>, they said. <When it is time. For now, we raise our lament. Listen to the dactyls.>

The dactyl's trumpeting wail seared Chava's core.

(Is any one alive?) Chava asked. (What will happen to Surry?)

<Surry's niri will take care of her>, the symbionts said.

Chava tucked away the realization that her symbionts gave the shift beast a name.

The dactyl approached with Owen already on its back, and lowered its head. Chava's symbionts told her it was time to go home.

She climbed on and rode under a river of singing stars. Owen chanted in a language Chava had never heard, with his head thrown back and his arms spread wide, and with no apparent fear of falling off the dactyl.

The dactyl lowered them at the entrance to the shift beast—the niri— functioning as Sick Bay. The dismount was as gentle as the receding of their altered state.

They found Katsuo, Kapi and Tommy tending to weak, malnourished Najaam colonists. Katsuo was inserting an intravenous line into Berat's arm.

“You know the only cure for this,” Owen said.

“I do,” Katsuo said. “My shift beast is distilling a solution for peripheral nutrition right now. Brimming with symbionts.”

“These people are all that's left of their colony,” Chava said.

Katsuo looked up from his work to peer into her eyes.

“Your pupils are dilated,” he said. “You ok?” He looked at Owen. “What are you two on?”

“Charta,” Chava said, giving a name to the sound the symbionts had made. She reached for the memory of what she'd seen at Najaam Saeid. “The symbionts...drugged us.”

“I was hoping you could tell me what you saw,” Katsuo said. “I need some clues about what spared these people and...not the others.”

Chava couldn't find the words to convey what the symbionts had told her. A new sensation, like a burning hand gripping her uterus, sharpened the silky haze of the ebbing charta. She breathed and looked for a place to sit.

“You've been through another traumatic experience, Chava,” Katsuo said. “You should go home and rest.”

The next contraction was stronger. Chava breathed through it and Katsuo noticed.

“It's only the second one,” Chava said.

“But it was strong,” Katsuo said. “I should check your cervix. I’ll take you to an exam room.”

Another contraction came as he helped her onto the exam table. Chava breathed in time with the symbionts’ song.

Katsuo touched her hand. She heard a snap and saw a glove on his right hand, and felt his gentle fingers on her cervix. The discomfort was oddly welcome. Chava closed her eyes.

“Four centimeters,” Katsuo said. “I think we’re going to have a baby.”

“Not now!”

“It’s ok, Chava,” Katsuo said. “You’ll be in labor for several hours. When the time comes, Kapi and Tommy can help with the other patients.”

“Have you ever delivered a baby?”

“Now’s a funny time to ask.”

“Well, have you?”

“Of course.”

“Since medical school?”

“Actually, no.”

“I think I’m scared,” Chava said. “I feel sort of high. I wish I could walk around.”

“Go ahead, there’s plenty of room between Sick Bay and the science habs. Let me show you for the first lap.”

Chava breathed and took a few steps. Katsuo steadied her with his hands lightly under her elbows.

“Where am I going to deliver this baby?” She asked. “Sick Bay is full.”

“You’re not sick. You’re having a baby, We’ll find a quiet nook in my office and tell the beast what we need.”

“I thought only Althea could do that.”

“I’ve spent more time with it than...never mind. It learns quick.”

“I’ll be ok for a while,” Chava said. “Go back to your patients.” But she felt a bit bereft when Katsuo went to the other

section. She walked for another half hour, and then looked for a place to rest.

<We taste something new in your blood>, her symbionts said.

(Hormones), Chava said. (Oxytocin, prolactin, beta-endorphins. I need them all in the proper balance.)

<We will tune.>

Shailey chimed in. “Would you like me to time your contractions?”

Chava nodded.

“They’re exactly one minute long and three minutes apart.”

“I wish you could check my cervix,” Chava said.

The next contraction built like a wave. When it peaked, Chava felt a pop, like a fist hitting the floor of her pelvis. A gush of fluid poured at her feet, shimmering.

“It’s full of symbionts,” she said, taking a few steps and grabbing the edge of a table. *Katsuo!* she called through their link. *My water broke.*

He didn’t respond

<Fear juices in your blood, not good for birth>, her symbionts said. <Listen to us. Breathe with our song.>

The symbionts sang. Chava felt like the lower half of her body was alternately immersed in, and eased out of a hot bath. The pain was at once overwhelming and triumphant, and she felt the planet’s spin, her only sense of time, until Katsuo returned and led her to his office. He stripped off her wet boots, socks and jumpsuit and covered her with a hospital gown.

“Now, let’s make a support for you to push,” Katsuo said.

The niri trembled, and a chunk of the floor rose and formed a chair to support Chava’s back and give her a place to rest her thighs.

Katsuo checked her cervix. “You’re at seven, going into transition.” He said.

“I need to push now,” Chava said.

“Breathe through it.”

After three more contractions, Katsuo’s checked again.

“You’re ready. Now, relax your thighs, and push!”

“It. Feels. So. Good. To. Push,” Chava said.

“Reach down,” Katsuo said. “You can feel the baby’s head.”

Chava’s fingers found the cap of a warm, wet, smooth dome.

“Breathe and push again,” Katsuo said.

His face seemed far away, framed by her open thighs. He grinned from ear to ear and tears spilled onto his cheeks. “I’m turning her little head, now,” he said, his voice husky. “This part happens fast. Now, push.”

The pressure on Chava’s pelvic floor lessened. She heard a squeaky cry as the baby slid out into Katsuo’s hands. He placed her on Chava’s chest and stroked her back. “You did it,” he said. “Let her find your breast.”

Chava was vaguely aware of another contraction as Allegra latched onto her breast and suckled as if she’d been doing it all her life.

“Placenta is intact,” Katsuo said. “Brimming with symbionts. I’ll wait for the cord to stop pulsing before I cut it.”

Allegra nursed vigorously, reaching up with one hand to touch the patterns on Chava’s face and meet her gaze with wide, bright eyes. Chava stroked the intricate symbiont patterns on the baby’s hairless head.

And then the newborn infant smiled.

# Chapter 37

*“The renowned Japanese mathematician and research scientist, Susumu Ohno, converted the mathematical formulas of living cells into musical notes in an attempt to make the patterns of complex genetic codes more discernible. In another experiment, Ohno reversed the process by converting phosphoglycerine kinase, an enzyme that enables humans to metabolize sugar, into a mathematical formula and then played its musical equivalent to a group of Japanese kindergarteners. He found that it always put the children to sleep because ‘It sounds like a lullaby.’ In another, he reversed the process, translating the notes of Chopin’s funeral march into chemical equations and found the entire passage appeared almost identically to a cancer gene found in humans. Ohno concluded, ‘This is not surprising, as nature follows certain physical laws, the universe obeys them, as does the process of life. Music follows the same patterns as well.’”* From *Music Affects Consciousness*, by Steve Robertson

Allegra was the center of Chava’s galaxy for the next two weeks, nursing for hours at a time, but also sleeping for long stretches. Katsuo stayed home, except to monitor the recovering Najaam Saeid survivors and make sure medical staff followed his orders. His nearness strengthened Chava’s link with him. Her blurry, sleep-deprived, oxytocin-overloaded state allowed her to accept his love and support, but there were still moments when she wondered what had given her the courage to leap off the ledge of trust and believe he’d catch her.

When Katsuo went to work, Leah lent help, giving a woman’s attention to Chava’s food and hydration, and hygiene.

Allegra grew and gained weight quickly. She moved gracefully, studying her hands and turning her head with as much

control as a three-month old and focusing on her environment with a bright, inquisitive gaze.

Summer passed in a fragrant haze, giving Chava a chance to look at her new world with Shabbat eyes, as Bree used to say. Look at the world as it is, not as a project. Allegra is not work. Be mindful of each moment.

<You are learning to Be>, her symbionts said.

Autumn came, bringing a cacophony of color. The Commons took on the air of medieval bazaar as colonists set up stations for cooking, weaving, music, and exercise. They shared their ideas and expertise through chautauqua style workshops and expanded the variety of beauty and hygiene products concocted from local ingredients.

One early afternoon, breathing air that tasted like wine as the soil's microbiome prepared to ferment the biomass of first frost, Chava nursed Allegra under a tent in the Commons and felt a song welling up inside. She sang the song with her symbionts, and the symbionts in the Commons returned the refrain, with a tangible buzz. Renata, who was very pregnant, joined Chava on the bench.

"My symbionts retuned just now," she said. "Everything is in sync. My symbionts tell me they want a ceremony to celebrate the morning after first frost."

"They told you?"

"Yes," Renata said. "They said to ask the Singer. The world wants us to learn now to Be and to Make, to Sit and to Sing."

Chava knew deep in her core that Renata had answered a call from the planet for something seminal. "I'll help you with a song," Chava said. "You can create the ceremony."

The morning after the first frost, Chava and Katsuo lifted their heads and their hair stayed on the pillow, unruffled and intact, like wigs.

Chava gasped and ran her palm over her smooth scalp.

Katsuo stared and touched her head. He pulled her closer. “Chava, Chava. I’ve never seen...anything...so beautiful,” he said, and her mind sparked with the joy and awe of his response to her.

She crept to the mirror. Her shapely head was a canvas of swirling color. Her face seemed more sculpted than before, with higher cheekbones and larger eyes. Her hands slid across her ribs, arms, and thighs, touching pliant skin like her churra’s, as if a new layer had grown over her epidermis, blazing with bolder patterns. She slipped off her sleep suit. Only her nipples were bare.

Katsuo stood beside her. His eyes were larger, too, with new patterns accentuating their epicanthic folds. Chava nestled into his arms, and the gentle hum of their symbionts synchronized.

Chava withdrew from his embrace and reached for Allegra. The baby’s skin had developed the new layer of epidermis.

Katsuo stroked Allegra’s arm. “If this is the silicone-altered genome of the biofilm, then we must be strange, new hybrids,” he said.

The shift beast opened a viewport to show them the Commons outside. Colonists were emerging from their homes, naked, hairless, touching each other with slow, cautious movements, murmuring, linking with each other to imprint patterns of recognition.

Chava and Katsuo stepped out into the crisp air. Renata and Owen ran to greet them.

“First Frost changed us,” Renata said.

Chava shielded her eyes and caught the first indigo shimmer of the niri larva. In the sky, a circle of dactyls wheeled, trumpeting a joyful blast. A shofar, Chava remembered, from another lifetime. Churras and round-eared *prinkha*, carpentermonks, and land-sharks formed a throng, as if waiting for something.

“The world was waiting for our song,” Owen said.



There was no work that day. There was feasting and dancing. Shailey linked to Chava and said, “Your home niri tells me Allegra is ready for kai kai.”

“Perhaps,” Chava answered. “But I’m not ready to give up nursing her.” She watched Allegra’s perfect lips relax and release the nipple to let a dribble of milk run down her chin. Chava sighed, inhaling Allegra’s fragrant breath, and realized Shailey had referred to the shift beast with a name for the second time. In Chava’s Jewish tradition, names held deep meaning. “Where did you find this name?” she asked.

Her symbionts interjected. <The name is the one we sensed flowing in you. We told the niri; it accepted. You gave us a name, too.>

What name did I give you?

<Sirphin. We are sirphin.>

Chava wondered if her embee had ever wanted a name.

Winter came again, with its piercing, purifying cold. The niris upgraded the adaptations from the previous year, creating a hot spring in the middle of the commons. The colonists discovered their new layer of skin protected them, but they wove cloaks and boots to keep from bringing moisture inside the niris.

Merging the remnant of Najaam colonists was a slow process, borne of necessity, but the sirphin made it nearly impossible for people to be coy, passive-aggressive or manipulative. Kapi and Owen spent much time with them, putting them to work with Berat, cataloguing scientific references to space flight and the wormhole.

By the time Renata gave birth to a son, Allegra was sitting alone and babbling, and Katsuo was monitoring 25 other pregnancies, including Leah’s, also sired by Jacob.

Berat and his crew, along with a few adventurous souls from *La Canasta*, decided to set off to re-explore the Oceana and Alpine regions, equipped this time with sirphin, niris and a third generation Surry.

Owen decided it was a good time for him to go exploring for several weeks.

Althea called a round table after the great departure.

“We’re growing more settled with each passing day,” Althea said, speaking aloud to facilitate communication. “Other than a few petty conflicts that people have resolved on their own, I’m not aware of any major issues in the colony. I don’t want to rain on this parade, but, don’t get complacent. No matter where you live it, life will always present hardships.”

Althea’s admonition rang in Chava’s memory one crisp cold evening as the pregnancies entered their third trimester. As Chava retrieved Allegra from climbing onto the kitchen counter for the third time, and wondered when Katsuo would be home, he sent an anguished cry through their link.

“*I need help in Sick Bay,*” he said. “*But don’t bring Allegra*” His voice was thick, and Chava tasted the salt of his choked tears, realizing her sirphin had been whispering all day to prepare her for great sadness.

Chava summoned Leah to stay with Allegra, and then pulled on her moccasins and crunched through the snow, taking the cold, pure air into her lungs.

She was halfway to the med hab where a keening wail pierced her ears. At first, she dismissed it as the wind, which sometimes sounded like voices as it vibrated over the niri membranes, but as she drew closer to Sick Bay, she saw a circle of dactyls on the ground spreading their wings and arching their necks. Inside the circle, a line of churras stood watch, keening softly.

Chava walked into a heavy, viscous sea of grief. It slowed her steps and filled her mouth with a taste like smoke and salt. A tinge of numbness blunted the edge of sadness, and she recognized the charta, reaching her second-hand. Her throat closed and her stomach knotted, but she forced herself to enter Sick Bay. Inside, the niri circulated scented air and cast a soft light on the five

women cradled in birthing chairs. Chava drew closer to a woman she knew as Maddie.

A tear shone on Maddie's cheek, reflecting Chava's face in its tiny, trembling facet. Maddie's pupils were dilated.

"I'm here," Chava said.

"Chava?" Maddie said.

"Yes."

"I wasn't sure it was really you," Maddie said. "I'm floating, and my body is far away." Her voice dropped to a whisper. "I know my baby died, and my eyes are wet, but this sadness doesn't feel... like my own."

Chava stroked Maddie's head. "The symbionts call it charta. It will help you get through this. In time, you will feel the grief." Chava's voice broke and her heart felt shredded. >Where is the charta for those who must witness this?> she asked her sirphin.

A few hours later, Katsuo and Tommy delivered five tiny, still babies and the niris wrapped them in shimmering pods.

<Call everyone>, Chava's sirphin said. <Sing the First Frost song before the churras take dead ones to funeral trees.>

(Why? Why?) Chava sobbed.

<These ones did not fit>, the sirphin said. <They would [pain]we would [pain]you would [pain] the good-bye is [giving] [refining] these ones give themselves, like First Frost.>

When Owen returned, he took Chava outside to look at the sky.

"I've been with the dactyls," he said. "They gather on the lee side of a cliff five kilometers from here, and they don't build shelters. They shelter each other. I haven't told Kapi this, and I'm not even sure how to explain it to her. I believe my sirphin belong to planet systems. Renata's, too, but not as fluently as mine. Althea's sirphin link to the niris, and your sirphin are conduits with the sirphin that live inside us. My sirphin gave me a word. Biosavant. Some of us understand the sirphin more deeply than

others. And the sirphin need us. So many babies are coming, and life in the colony will become more complicated. We'll need more food, more shelter, more water. We'll create more waste, and we'll be distracted, preoccupied with keeping the new generation alive and healthy. We'll create systems, hierarchies, economies. People always do. There will be disharmony. We can't risk harming the planet. We need to guide the people in using the sirphin. The dactyls tell me the churras will help us."

"Why are you telling me this?" Chava said.

"The dactyls say you're the First Mother. You seeded the sirphin with new life. The First Mother is the Cantor who tunes the song they sing."

Chava saw her *malak*, and knew Owen's words were true.

For the next weeks after the Refining, Chava dropped all her other duties except caring for Allegra, to spend time talking and singing with the grieving women.

Maddie approached her as the twenty remaining pregnancies came to term.

"My breasts are leaking," she said.

"Show me," Chava said.

Maddie squeezed a nipple and a big drop of golden fluid dripped onto her fingers.

"Colostrum," Chava said.

"I know things," Maddie said. "About labor and babies and care after childbirth. But I don't know how I know these things. I asked Shailey. She said there's a word for it.

"Doula," Chava said. "The word is doula."

While they waited for the remaining pregnancies to come to term, Chava and Katsuo clung to Allegra with new appreciation.

"I've always wanted to remember what it was like to be preverbal," Katsuo said. "Our link with Allegra approximates that state. I feel her longings, her hunger, and her questions."

"Same here," Chava said. "I experience her thoughts in pictures, sounds, smells, tactile sensations. My brain often

translates the input into words. But I have the advantage of the innervated structures my embee created.”

“Should we watch Allegra for that development?” Katsuo said.

“I don’t think it’s in my genome, but we can never guess how the sirphin will adapt.”

“When Allegra plays with Jacob’s son, they babble,” Katsuo said. “But they also play quietly for long stretches. It’s not just parallel play. They interact and pretend way ahead of schedule.”

During the blur of delivering twenty babies over the course of two weeks, Chava helped when she could. The five doulas kept Katsuo and the medical staff from exhaustion, taking turns assisting the laboring mothers and supplementing the babies’ feedings.

It was a bittersweet time, and as soon as the new families settled into their postpartum routines, Katsuo and Kapi asked Shailey to shift focus and look for genetic markers in common with the five stillborn babies

“We don’t have long before another batch of pregnancies enters the third trimester,” Katsuo said. “Twenty five percent is a high rate of failure. I’m afraid if this pattern persists, no one is going to want to risk pregnancy.”

Shailey asked for patience. “I’ve already identified several factors the refined babies had in common, but it will take some time to pinpoint them further. I predict it will take several generations before the odds of the refining are reduced. And the factors may never disappear from the gene pool.”

The colony breathed a collective sigh when the Refining claimed only two of the next cohort of infants.

<Life always comes with cost>, Chava’s sirphin told her.  
<But it always repays.>

# Chapter 38

*“I dream in pictures/ in flashes and half-phrases/I see its shape/ in the outlines and edges/ the light/ the brilliance/looking after its shadow/ when I reach out to touch, it disappears/I can almost catch it: / the melody of the echoes I hear/the sound/ the ringing/of beauty/the light/ Excerpted from “Brilliance,” by Annie Quick, David Sacks, Jad Mintun, from *Blinding Bright*, Stickman Jones, Sungstone Records*

Chava worked in a tangle of timbor vine, counting different “insect” species that were indicators of a healthy holobiome, but her mind wandered to Owen’s musings about the complications of colony life.

Leah approached, wagging her daughter Tamar, and Jacob and Renata’s son Asher. “I have something to show you,” Leah said. She smiled into her daughter’s eyes and called Tamar by name. Tamar responded by handing a teething toy to Asher, babbling briefly. Asher answered with his own spate of cooing syllables, and the infants’ pure curiosity, joy, and satiated contentment seeped into Chava’s mind.

“Their links enrich us all,” Leah said. “And I have found my calling. I’m going to ask the captain to let me organize child care and education for these little ones.”

Althea strolled up to join them. “I heard my name. We’ll talk about your good idea, Leah. But first, I need to ask Chava, how soon before you wean Allegra?”

“We’re working on it now,” Chava said. “She’s thriving on simple foods.”

“Good. Berat asked me to come to Mount Sereya with a science team, but I’m needed here. I’d like you and Owen and Kapi to go. Katsuo, too. Think of it as a vacation.”

“But it’s already winter in the Alpine zone.”

“Ask your niri for skis, then.”

“But is it safe? I heard a lightning and wind storm forms in the region between the savanna and the tree line.”

“The storm is a summer phenomenon,” Althea said. “So just enjoy the scenery. Berat thinks it looks like wine country.”

Beyond the savanna, Chava caught glimpses of new species of plants and animals. When the troupe took advantage of the brilliant night sky and traveled for a few kilometers more after the evening meal, she saw nocturnal creatures mimicking the patterns of stars.

By the second night of the three-day journey, Chava’s longing for Allegra grew visceral, but the infant soothed her through their link.

The caravan arrived at the Najaam settlement at dusk on the third day just as the niri lodges began to glow like snow gems in at the base of the mountain.

Berat welcomed them into the great lodge. His eyes hadn’t lost their sadness, but his long body finally seemed at ease in EpsIndi’s lighter gravity. A woman joined him at the simulated brazier in the great room. She sat close, and her sirphin swirled in the patterns of intimacy as he put his arm around her.

“Jenny?” Chava said, taking her cue from the woman’s short stature and nervous habit of scratching her nose.

“Jenny is the reason I called you here,” Berat said. “She discovered that the niris need your help to satisfy their longing for space,” Berat said.

“Space?” Kapi asked.

Berat y turned his eyes toward the ceiling. “The niris long to explore,” he said. “Jenny is our niris’ conduit. Our Althea. Tell them, Jenny. Don’t be shy.”

Jenny gazed into his eyes for a moment and then turned to her guests.”The niris were patient to gain our trust,” she said. “First they pointed out how they protected us from the biofilm. Even our

antimatter drive is intact, and we are looking at resources to replicate it. Our niris believe they can interbreed with the submarine Oceana species, and produce oxygen and fuel using the planet's nutrient cycle. They want to go to space as living ships. The niris don't know how they'll deal with the problem of radiation and cosmic particles, but, we can be patient, too..."

"But what do the niri have to gain by helping us go to space?" Kapi asked.

Jenny stood and spread her arms. "Close your eyes and listen," she said. "No, 'listen' isn't the right word. Feel. Feel what is around you."

Chava breathed slowly and allowed her body to attune to all the streams of consciousness she'd learned to filter and dampen.

<Our joy. We are curious. We reach and the reaching is joy>, her sirphin said, and Chava heard Casandra's voice as if Casandra was standing in the lodge. "We're doing it because exploring is what humans must do. So we can evolve."

"Is that what motivates you, now, Berat?" Chava asked. "With no commercial enterprise, no mining, no need for rare elements, no market for anything we have on EpsIndi?"

"This world is full of wonders," Berat said. "Have I told you what we learned about the slime monster? There's a terrible cost for not living within the means of this planet. The cost is decay, necrosis, and being sent back too early to the nutrient river to be recycled. But living within the planet's means is not too much to ask. The planet will repay with redoubled joy. I hear the Song."

That night, sleeping in a niri at the base of the mountain, Chava met Bree in a dream.

"Rabbi, there's something bothering me," Chava said. "It's the story of the Garden of Eden."

"What don't you understand, Chava?" Bree said. Chava could only see Bree's scarlet lips and flashing white teeth.



“The punishment for eating of the tree of the knowledge of good and evil was death. I always thought this story is about humans becoming sapient. And now we have a whole planet that is self-aware. But life on EpsIndi has always known death, not as a punishment, but as a gift for the fullness of life. We are the ones who must reimagine death.”

“Chava, you are the rabbi, now,” Bree said.

“No, the planet is the teacher,” Chava said. “Are we still waiting for Messiah?”

“No,” Bree said. “Messiah has always been. We were looking in the wrong place. Messiah is life and death and birth.”

The next morning, Chava drank strong tea with Berat.

“I see by your eyes, you know,” he said. “We must keep the knowledge of space flight until the wormhole reappears,” he said. “Our descendants must take our hope back to Earth.”

“If Kapi and I can help you develop the fuel source, we will,” Chava said.

“We need more than that,” Berat said. “I’ll say it again. We need to pass along our knowledge of science and the wormhole. With all our needs met by the planet, we’ll get soft, lazy and stupid if we don’t have something to reach for.”

Winter was nipping at the heels of autumn when Chava, Katsuo and Kapi returned to the colony. Owen greeted them from the back of a dactyl.

“The Thunderbirds remind me that we need a way to mark the seasons,” he said, as if picking up a thread of conversation that had never been broken.

Allegra and Asher toddled out of Leah’s reach to pet the dactyl.

The dactyl raised its head and crooned a reedy note and the children pursed their lips and mimicked the sound. Their first attempt was breathy dissonance. The second try was piercing and pure.

The dactyl bobbed its head in appreciation.

<The children know the Singer>, Chava's sirphin said.

<Let them name the seasons. Let them name the moons and the night's companions.>

Chava's' next pregnancy was the regular kind. Katsuo was overjoyed.

"I suddenly have the urge to paint." he said. "I guess I have too much time on my hands. People don't get sick enough to need a doctor."

The niris built a wall for him and he adorned a mural with portraits of the colonists, landscapes, starscapes and whimsical geometric patterns.

When she saw it, Chava was flooded with memories of Isaac. She sat on her heels, rocking Allegra. "Isaac Rosenberg," she keened, "How I miss you."

# Chapter 39

*“Because more often than not, it is in the dark, damp, ugliness of death where the most interesting and creative things happen.”* by Levi Gardner, *The Rose & The Garbage: Discovering the Divine in the Compost Pile*, published in the *EcoTheologist Guest Blog*

Senescence was a gift Chava didn't expect at age 70 as measured by Earth time. It was a gentle slowing of her movements, but not a dimming of her senses. She had always imagined living to be 90 or beyond, but that was not the way of this planet. It was a comfort to know Katsuo would live a bit longer, and their offspring would not be bereaved of them both at once.

Working in the garden with her grandson Gelen on a morning that smelled like citrus and cinnamon, Chava touched Gelen's heart sirphin to tune it to hers.

They needed no words. Gelen understood Chava was teaching him how the carefully mounded compost intensified the synergy of living things that fed the plants and aerated the soil.

Gelen sat back on his heels. *“Ima,”* he said, speaking the term of endearment. *“Is it true that in the olden days, people said all their words out loud?”*

Chava laughed. *“It is true,”* she said.

*“EEEuuu,”* he said. *“That must have been like biting into a sour sorrel.”*

*“Some of the old words are beautiful,”* Chava said. *“Especially when they're sung.”* She stood, brushed the soil from her knees, and took a deep breath. *Baruch ata Adonai Eloheinu Melech ha-olam,* she sang.

Chava wasn't surprised to see her *malak*.

*“Look up,”* the *malak* said.

Chava saw a glowing Jacob's ladder stretching up to the river of stars. *"They did it,"* Chava said. *"The alpine niris have built a space elevator."*

*"And the submarine niris have learned to convert kelp slime to food and fuel,"* the malak said. *"Next, the niris will breed some larvae to make a space station. In time they will incubate ships. In time."*

Chava sang the Avahah Rabbah. *"I can take my rest, now,"* she said. *"I will return to the Singer."*

## Part III

*“The reversibility of time and of the causal order is fundamental in religion, for otherwise the principle of conversion would be sheer nonsense. The act of reconstructing past psychological life, of changing the arrow of time from a forward to a retrospective direction, is the main premise of penitence. One must admit with Kierkegaard that repetition is a basic religious category. The homo religiosus, oscillating between sin and remorse, flight from and return to God, frequently explores not only the traces of a bygone past retained in memory, but a living “past” which is consummated in his emergent time-consciousness. It is irrelevant whether reversibility is a transcendental act bordering on the miraculous, as Kierkegaard wants us to believe, or a natural phenomenon that has its roots in the unique structure of the religious act. The paradox of a directed yet reversible time concept remains.”* by Rabbi Joseph Dov Soloveitchik  
*The Halakhic Mind*, 1944 essay

**T**he Singer knows, this paradox is retuning the universe at every scale. All that remains is miraculous.

# Chapter 40

## Earth Present 1

*“Religious faith is a most filling vapor./ It swirls occluded in us under tight/ Compression to uplift us out of weight--/As in those buoyant bird bones thin as paper./ To give them still more buoyancy in flight./ Some gas like helium must be innate.”* From *Innate Helium*, By Robert Frost, from *Complete Poems*, 1949

12 September, 2189

Beta Colony Sigma 77

CHASE

Minnesota Point, New Ontario

The pulsing rain lashed the flexible roof of the habitat and roused Collum Bruce from making love to his wife. It was a dream. If he kept his eyes closed, maybe he could recapture it and resume where he left off, to hear that little gasp she made when he entered her. It never failed to move him, and he would lose himself in calibrating his response to her exquisite internal muscle contractions.

“This isn’t normal,” she would say. “It’s best to keep it a secret.”

But it hadn’t been enough to hold her when their world fell apart.

The wind shook the hab’s walls, jarring Collum fully awake. The dream drained away.

He sat up, swung his legs over the edge of his cot and pulled a band from his wrist to secure his dreadlocks before snatching his pants from a chair and standing to stretch.

“Wind and rain. Imagine that. My favorite conditions for mulching kale and broccoli,” he said. “Bailey,” he said, “play Ganja Farmer.”

Collum improvised new lyrics as he danced into his pants:

*Everybody has to pull their weight  
Even if our colony is second rate  
And if we never get to go to space  
Maybe we can still save the human race*

*Ganja Farmer  
Ganja Farmer*

*I just want to be a Ganja Farmer*

*Ganja Farmer  
Ganja Farmer*

*A Ganja Farmer in space*

*I have a doctorate of divinity  
A masters in psychology  
I minored in anthropology  
And dabbled in philosophy*

*But I'd rather be a  
Ganja farmer  
Ganja farmer.  
I just want to be a Ganja Farmer*

*Ganja farmer.  
Ganja farmer.  
A Ganja farmer in space.*

Bailey overrode the music. “Good morning, Dr. Bruce. Commander Worth requests your presence on Base. Dr. MacQuoid will pick you up at 0900 to brief you on the way.”

Collum waited under the canopy until he saw the ATV emerge through a curtain of rain, and then he dashed outside to meet it. His poncho was soaked by the time the ATV glided to a halt.

A flap opened in the compartment behind the cab. Collum took it as an invitation to duck inside. The interior smelled like biovinyl and patchouli. A mesh window separating the passenger compartment from the cab provided the only illumination. When Collum’s eyes adjusted, he saw EvaLynn seated on the fold-down bench across from him. She was the source of the patchouli scent. She turned her head and the faint light fell in a crescent on her cheekbones.

The vehicle made a smooth three-point turn. When it swung forward again, EvaLynn said, “We’ve lost contact with *La Canasta*. That’s why we need you on Base.”

Collum leaned against the taut fabric wall of the compartment, feeling its tiny vibrations. He couldn’t tell where he felt EvaLynn’s words.

“You barely missed the cut to go on that ship, so you’re going to have to face that,” EvaLynn said. “And then work with me to help us all move on.”

“Move on? We’ve given up? After only eight months? Isn’t there a plan for this sort of thing?”

“It’s been seven and a half months,” EvaLynn said. “The ship launched on March 5. Of course we knew losing contact with the ship was possible. It’s complicated.”

“Can’t we send a drone to check on it?”

“Like I said, it’s complicated,” EvaLynn said. “That’s why I asked for you. People will respond either by grasping at faith or losing it. I think you know something about both.”



“I wasn’t good enough for the first mission but I’m good enough to deal with its loss?”

“You were too good for the first mission.”

The vehicle swooped around a curve and Collum raised his hands to brace. “This doesn’t feel like the route to the base,” he said. He peered through the mesh window to the cab, where the windshield cast silver daylight on the driver’s reddish stubble and the intricate tattoos covering his thick neck. The driver’s shaved head bobbed forcefully in a steady rhythm, as if he was listening to music.

“That’s Brian MacLeod,” EvaLynn offered. “From Gamma 10. Our best driver. God, I need a joint.” She reached under the seat and pulled out a small fabric case. “Care to partake?”

“I’d love to,” Collum said. “But it’s early and things are already too weird. Looks like you could use some help, though.” He took the joint from her fingers, expertly re-rolled it and handed it back.

EvaLynn flicked a lighter, lit the joint, took a long draw and held it. Her exhalation was more like a sigh. “You’re the first person I thought of when I got the news,” she said.

Collum pushed down memories of Chava and Katsuo and Kapi and Jacob. He’d lost them at launch. Not again, no thank you, EvaLynn. You’re not going to pull that crap on me.

“Mine was a purely selfish response,” she said. “You make me laugh. Your presence...” she waved a hand. “You remind me of being young and free and rebellious. I remember the first time I met you.”

“Yeah, so do I,” Collum said. “After that interview, I was sure I’d never hear from you again.”

“I was pretty harsh. By the way, I didn’t follow the script. I found it too curious that a person with a doctorate in divinity would call the concept of the ‘divine’ a dysfunctional metaphor and yet self-identify as a Christian.”

“I guess you didn’t read my dissertation.”

“Hell, I didn’t read my own. But here we are.”

“How can I help if I don’t know what’s going on?”

The vehicle slipped along in silence except for the swish of rain on the roof. EvaLynn blew another long plume of fragrant blue smoke. Collum was beginning to feel its secondhand effects.

“Are...you...sure..you...don’t...want...a...hit?” EvaLynn asked.

“Save me the roach,” Collum said. “You still haven’t said where we’re going.”

“To hell,” she said. “But nobody believes in hell anymore. It’s a damn shame. Some people belong there.”

Collum swallowed a knee-jerk rebuke. He figured she didn’t really mean it. “I’m listening,” he said.

“Like, whoever screwed up this mission. And don’t get all therapeutic on me.”

“Why not? Who’s taking care of you?”

“Not relevant,” she said. “But you always make a good point. Yes, indeed, you always do. Case in point: the interview question about the morality of CHASE accepting funding from the Saudi Prince Fahid...with money derived from that country’s former Sovereign Wealth Fund.”

“The assholes who wrote that question didn’t know who they were dealing with, but I saw that look in your eyes,” Collum said. “I went full Lecan psychoanalytic theory on you.”

“You called bullshit on its imaginary ideal of morality and got straight to the Real,” EvaLynn said.

“Damn right,” Collum said. “So what if the former OPEC nations revested their SWFs in progressive causes to spite the alt-right capitalists? My education and postdoctoral fellowship were sponsored by an organization funded by a SWF.”

“That was the point of the question,” EvaLynn said, and her voice trailed off.

Collum’s mind swam with disjointed thoughts about *La Canasta’s* crew, the colonists, all those lives, their families,

CHASE's guilt-ridden officers and crew, and then the obscene realization that CHASE was still indebted to Najaam Saeid. He knew EvaLynn was messing with him. This wasn't idle small talk. He also knew it was futile to keep asking questions.

The wind picked up, lashing the fabric over their heads, and the vehicle slowed to a crawl.

EvaLynn leaned closer to the mesh window. "MacLeod, is everything ok?"

"It's practically a washout here, but these tires are made to handle anythin'," MacLeod said. "It's gon'ta take quite a bi' longer to get where we're goin'. And it could ge' bumpy."

"My ass—what there is left of it—is already numb," EvaLynn said. She held the nub of joint between her thumb and forefinger and rummaged in the case. "Damn it. I can't find my roach clip. Will you help me roll another?"

Collum yanked the case from her hands, surprised by a surge of fresh grief and angry self-pity. He sorted through the case and held a bag of cannabis buds to the light.

"It's local," EvaLynn said. "Beta colony grows it."

"Then I'm in the wrong place." He started humming "Ganja Farmer" in a sarcastic tone.

"Better have some," EvaLynn said. "Might help ease the pain. Multiple losses. Cumulative grief."

"Yours or mine?" Collum asked.

"This loss is ours," EvaLynn said. "But your grief is your own."

"At least I'm not living in a bubble, believing bad things can't happen to me."

"I tried that," EvaLynn said. "It worked for a while. Speaking of bubbles, Captain Harrison said that's what the wormhole looks like. A shimmering bubble. That was the last transmission we got, before they went though."

"Wormhole?" Collum said, feeling the blood drain from his face.

EvaLynn’s hand trembled as she took the fresh joint from him. “I’m so scared.”

## EpsIndi Present 1

*“The wound is the place the light enters you.”* Rumi

The longing flared and collapsed with every breath Saavi ai Hava Rohsen Minnosh took. Its ache was strong here, at Mount Osmon, where the thin atmosphere unveiled the Dust Cloud by midmorning and the Maker and Sitter moons hung like ripe fruit. As the time grew near for her son’s birth, the longing gripped Saavi like half-sated desire. It was unseemly, especially for one so attuned with her sirphin; for one whose pregnancy had passed the Refining’s first node. According to the teachings of Althea, the first biosavant, the longing implied that Saavi craved more than the sirphin provided. But Saavi felt no lack; she simply yearned to return—to what, or to where, she had no idea.

She’d been waiting for her *malak* to unveil that mystery since the day she felt the longing’s first pang. She was a small child, playing beneath a table in her mother’s studio, twirling her hands to catch spilled jewels of color as the sun’s rays pierced the hand-blown goblets, vases, canisters and dishes on display. One sunbeam began to tremble and condense. It cooled from gold to blue, and spun into the shape of a head and shoulders. <This is your *malak*, her sirphin sang>, she clapped her hands for joy and called to her mother. “Do you see it? My *malak*?” Chimes of shattering glass pierced the song and Saavi cowered. Her mother appeared with sirphin flaming and an arm raised. Llana’s face was twisted, her nostrils flaring and her breath trapped in her throat like a wild thing. Saavi’s face stung and she fell backward. Her father caught her and his sirphin synced with hers. He grabbed Llana’s wrists and pulled her out of Saavi’s view, and then, he gathered

Saavi in his arms as she keened, “He sang to me, *Adiim*. The *malak* sang to me.”

Would her *malak* mark this day important enough to visit? If he was with her on the day her parents died, on the day she celebrated her menarche, on the day she graduated from the Institute, as well as on the day she took the lead astronomy position at Raismon Observatory; if he was present on the day she married Ahlan and on the day Ahlan left to captain his first fleet in the Belt, surely he would come on the day she returned to her mother-nexus to give birth. Surely. Her *malak*'s song always helped her bear the longing.

Weary of packing, she rested her eyes on the view of Mount Osmon's jagged summit. At this latitude, the sky was hemmed in sapphire by late afternoon and studded with the rusty light of EpsIndi's brown dwarf star companions and the opal pinpoint of the System's fourth planet, Najaam Dunia.

Saavi's sirphin drew her attention to an heirloom vine lacing the viewport. “You want to come with me,” she said as she detached its sticky tendrils and wound it into the base of its pot. “Of course, you do. You are Jaidha's gift and I wouldn't part with you, even for a few weeks. Jaidha says my charta will keep my mind off my work. My charta and my baby and the rhythms of home will saturate me with contentment. Can a doula really know this? If the wormhole appears, no charta will be strong enough to distract me.”

<Why are you sad?> The vine queried through Saavi's sirphin.

(This isn't sadness), Saavi answered. (It is longing.)

She brushed flecks of potting soil from her fingers. Its dark, spicy fragrance awakened another memory: taking the compost from her parents' funeral tree; the particles clinging to her nostrils and coating her throat as she helped her uncle sprinkle it into the family plot; his white-knuckled hands gripping the moist, fragrant clumps of humus; red-black streaks of it on his face as he swiped

tears. Plunging her hands into the silky, warm muck and asking, “Why do we cry when someone dies? If nothing died, we wouldn’t have this dirt for things to grow in.” Thinking she caused his look of fresh pain as he swept her up, crushing her to his chest to hold her until his quake of grief subsided. Of course it was her fault: her sirphin failed to dampen the longing and it unsettled her parents so much they drove into the storm. Saavi would make it up to her uncle, if it took her whole life.

“*Saavi?*” Her uncle link-spoke her name.

She turned and saw her *malak* instead. She gasped, and the purple and emerald sirphin beneath the skin of her forearms tuned their harmonics and flowed into their signature response to him. The *malak* faded, but its presence remained as her uncle’s holo coalesced in front of her.

“*You weren’t planning to leave without sharing the moment?*” Rodhyn pointed to his heart: giving the only outward sign of the conversation.

“*Of course not,*” Saavi answered through their link-bond, with a slight head tilt and one raised brow. “*I was waiting for you to be done with your class. Why aren’t you teaching at this hour?*”

“*Cancelled,*” he said. His heavy-lidded black eyes looked more far-sick than usual. Far-sickness was the name Saavi gave his affliction: an obsession with the wormhole and Earth. “*Today we both return to our homes.*” he said with a deep sigh.

“*I don’t understand.*” Her mouth formed a small oval with the question.

“*SkyFall Day!*” he said. “*I embarrass the Institute.*” He shrugged. “*Waiting 501 Earth years for the wormhole to appear strains my credibility. Apparently, the Institute understands the physics that transported our ancestors back in time better than I do. And now, the kelp blight. The Institute’s funders say it is the sirphin’s warning. I knew this day would come, but I hoped I would never see it: the Institute is halting wormhole research.*” Rodhyn looked away. “*I will step down. They’ll say laudable things: that*

*my scientific contributions are invaluable and will stand the test of time. That I will be remembered as a beloved professor. That my stipend will keep me comfortable until my churra calls me. But they are withdrawing my access to the Observatory array."*

*"That's ludicrous," Saavi snapped. "In fact, you should already be here, at the Observatory, waiting for the wormhole's appearance. No one is better qualified to assess its stability."*

*"Do you remember the interview I did with 'Why It Matters?'" Rodhyn asked. "On first SkyFall Day? I explained it all in lay terms. But fear mongers hear only what they already believe. All they took was my cavalier, oversimplification: wormholes are just black holes with negative energy density. With that one statement, I launched the Koshim anti-wormhole movement. As if the laws of physics were my own evil plan."* His eyes focused as if seeing her for the first time. *"The Stream airs again tonight,"* he sighed. *"You go home, prepare for your baby. I will join you when you summon the family."* He brought his palm to his forehead. *"Oh, I almost forgot. Your aunt is waiting at your home. She didn't want you to return to an empty niri."*

*"Ah..." Saavi said. "That's good. Ahlan is three days out."*

*"But, prepare your heart,"* he said, pressing his hand to his sternum. *"Our detractors have infiltrated Mamrhe. Don't let the Koshim black banners hinder your charta."*

Saavi watched him leave. Her heart felt raw. She hugged her gravid belly and walked out of her office.

# Chapter 41

*“Whenever there is a decline of righteousness [dharma] and rise of unrighteousness then I send forth Myself. For the protection of the good, for the destruction of the wicked, and for the establishment of righteousness, I come into being from age to age.”* Lord Krishna, *from the Bhagavad Gita*

## Earth Present 2

Inhaling the second hand smoke from EvaLyn’s joint was taking the edge off Collum’s shock, but he wasn’t sure that was a good thing. His mind was still doing cartwheels.

“How did you keep the wormhole a secret?” he asked, and then regretted it. He was about to lose his cool. “Does the governing board know?”

EvaLynn put a finger to her lips. “Shush,” she said.

“Why can’t you give me a straight answer?”

“Because there aren’t any straight answers,” she said, eyes flashing. “Even telling you I’m taking you to see Thomas Manitowabi is not a straight answer.”

“Why the hell are you taking me to see him before we go to the Base? Does Thomas know about the wormhole?”

“No. He doesn’t even know we launched. He thinks we’re still beta testing the colonies.”

“That’s a pretty shitty way to treat the Ojibwe First Nation,” Collum said.

“We pay them well for the use of their land.”

“So that’s how you justify it? Jesus! Even without the wormhole, this mission has spawned the most persistent protest movement I’ve ever seen, and Thomas has kept the peace.”

EvaLynn glared at him. “Do you think you’re enlightening me with your superior moral standards? We did what we had to do



to keep Russia and China out of our business until the colonies are viable.”

Collum took a deep breath and considered reaching for the joint. Nope, he decided. Things are trippy enough. “Why are you taking me to see Thomas?”

“He called for me,” she said. “You’re just along for the ride.”

“Bullshit.”

“I already told you I’m scared. The timing worked out to bring you with me. I’m glad.”

The vehicle rocked to a halt. EvaLynn led Collum outside, ducking under drenched pine branches. They were nearly on the steps of a small camping trailer before he saw it through the rain.

Collum blinked in the bright LED lighting. Two burly men stood just inside the entrance, so tall, their heads were bent beneath the ceiling. Another man and a woman sat with their hands cupped around mugs at a tiny table that held the remnants of breakfast.

Collum shrank back, feeling blunt and unfinished in their presence. Their features were strong and refined. The men wore their long, dark hair pulled back and the woman’s hair was braided. Collum couldn’t help staring at the curves of their deep brown, elegantly-lidded eyes.

The man at the table stood, so tall he needed to stoop. “EvaLynn MacQuoid. I see you have brought Kokopelli,” he said. His tone was mild but his eyes were narrow.

Everyone laughed except Collum.

EvaLynn’s smile was forced. “This is Collum Bruce,” she said. “He’s a member of a test colony and I’m taking him to the base.” She turned to Collum. “Collum Bruce, meet Thomas Manitowabi, his wife Magdalena and his friends Phillip Crane and Joseph Dekanti.”

“Phillip and Joseph take security seriously,” Thomas said.

“I can wait in the vehicle,” Collum said quickly.

“No, Kokopelli,” Thomas said. “If EvaLynn MacQuoid brought you when I summoned her alone, she assumes the risk. Sit.” Thomas gestured toward his vacant seat. “Our coffee is strong. EvaLynn MacQuoid craves something stronger, but I see she has it already.”

Magdalena rose and offered her chair to EvaLynn. She poured coffee for them. After serving it, she stepped back, leaning her elbows on the countertop.

Collum’s hands fit nicely around the warm mug. Coffee wasn’t available in the colony. He sipped slowly.

Thomas sat on the bench across from the table, spreading his hands on denim-clad knees. “Collum Bruce, I apologize for calling you Kokopelli,” he said. “Kokopelli is not even an Ojibwe legend. But you look like him. Your face was once shaped by mirth, but now your eyes are sad. Why do you want to go to space?” He raised one hand to flick the question away. “No, don’t answer. There are no words for such a thing.” He looked at EvaLynn. “EvaLynn MacQuoid knows we follow the traditional ways of the Ojibwe only so far as they guide us. According to the nature of reality and the universe. She is our *Waagoshii-Mindimooye*, our Fox Old Woman. As long as she keeps our trust.”

Crane and Dekanti shifted their weight. The motion rocked the camper and Collum felt it as a metaphor deep in his bones. He glanced at EvaLynn. Her pupils were dilated.

“*Waagoshii-Mindimooye*, tell us what has changed,” Thomas said.

EvaLynn raised her eyebrows and took a long sip of coffee. “Our people are seeing signs of an upheaval,” Magdalena said.

“What signs?” EvaLynn asked.

“The *miigis*,” Magdalena said. “I’ve seen them, too.”

“Even I have seen them,” Thomas said. “I, who has always been too proud to believe in spirits.”

“What are the *miigis*?” EvaLynn asked.

“According to our oral history, the seven great *miigis* are shining beings that appeared to our peoples at the beginning of time to teach them the way of life,” Magdalena said. “One of the seven *miigis* was so powerful, people died in its presence, so it returned to the ocean. The six great *miigis* that remained established our clans and then they also returned to the ocean.”

Thomas nodded. “I believe the ancestors used the ocean as a metaphor for the vastness of space,” he said. “But that’s just my interpretation. Anyway, the ancestors say when the Europeans came to our lands, one of these *miigis* appeared again. It told our people to move farther west or they would not be able to keep the traditional ways alive.”

“Our people didn’t see the *miigis* when the Pacific Islands and the North American coastlines submerged,” Magdalena said. “We didn’t see them during the COVID or Ziki pandemics. We didn’t see them in the African water conflict or the asteroid wars. So we believe they have returned now for some threat that extends beyond our planet and our system.”

“But we haven’t received any warnings from them,” Thomas said. “Maybe they believe we already know what is wrong.” He looked directly at EvaLynn. “Maybe they’re just waiting for us to fix it.”

EvaLynn gripped her mug. Its liquid trembled. “I will tell you,” she said, “but I need more time. You are right that something has changed. We just aren’t sure what happened.”

Thomas stared at EvaLynn and Collum in turns. “Kokopelli is just as unsatisfied with your answer as I am,” he said.

The relentless, lashing rain on the camper roof filled a long silence. Thomas’s voice was softer when he spoke again.

“My sister is well?”

“Yes.”

“Ella Roca is well?”

“Ella is fine.”

“If I have news for you, I will give Ella the sign. If you have news for me, send Kokopelli to the Base security gate. The protest leaders will know what to do.”

“Why do you want us to send Collum to the gate?”  
EvaLynn asked.

“Because Kokopelli needs to look outward once in a while,” Thomas said.

EvaLynn tilted her head in thought, and then nodded and stood up.

Collum rubbed goose flesh on his forearms. He followed EvaLynn back to the vehicle.

MacLeod stuck his head close to the mesh window that separated the cab from the passenger compartment.

“Commander Worth is wonderin’ wha’ happened to ya,” he said, “I told him we go’ stuck.”

“That would be the truth,” EvaLynn said.

## EpsIndi Present 2

Saavi withdrew deeper into the folds of her hooded cloak, watching the red sun, large and low on the horizon, set fire to a ribbon of clouds as the niri train slipped through the burgundy grass, intent on wending its way without leaving a trace.

After the exhilarating dactyl flight from Mount Osmon, Saavi was looking forward to a serene trip through the savanna. The seat beside her was vacant—a small comfort. She’d boarded the train at the Institute station. News of her uncle’s resignation traveled fast, and Saavi had already acknowledged a few awkward nods from faculty and staff on board.

She focused on the hum of her bond with Ahlan. Even at a distance and dependent upon his ship to boost the signal as he headed home from the Belt, the link-bond calmed her.

Ahlan linked as Saavi finished the thought. “*I’m tracking your path home,*” he said.

Saavi's sirphin flurried to send her response to a booster near the Hub that routed the signal through an array of living ships extending to the Belt.

*"I'm sorry about your uncle," Ahlan said.*

*"You know?"*

*"Gameya told me. My sister, gloating."*

*"What did she say?"*

*"It's not worth repeating," Ahlan said. "Just get home and settle."*

*"How can I settle if I don't know what Gameya is scheming?"*

*"At least she's predictable. Leveraging her influence as First Mother, vying for a seat on the Commonwealth Council, tuning her song to tickle the ears of every audience."*

*"Even Kimosh? Rodhyn told me there are Kimosh flags in our garden."*

*"Gameya didn't mention that."*

*"Do you think the Institute is afraid of Kimosh?"*

*"The Institute is afraid of its funders," Ahlan said.*

*"The timing is heartbreaking," Saavi said. "We were so close to balancing the solution for exotic matter with the one for acceleration, to account for the time discrepancy."*

*"So...you and your father can keep working from home. You still have access to the Array."*

*"What if the wormhole never appears?"*

*"Your research will stand the test of time," Ahlan said.*

*"And so will your uncle's legacy. Maybe someone will use your work to create a stable wormhole. Nothing is wasted, you know that, don't you?"*

A faint buzz in Saavi's sirphin signaled that people were dampening their links for privacy. Maybe they were tuning to *Why It Matters*. Saavi shrank further into her hood. *"Am I selfish for wanting the wormhole to appear?"* she asked Ahlan. *"What if Koshim is right?"*

*“Does it make sense that the wormhole designers had a death wish for our planets?” Ahlan said. “I believe the opposite. That the people of Earth sent us back in time so we could flourish on EpsIndi and share what we’ve learned for the past 500 Earth years. Besides, my sirphin tell me we can only respond to what Is. And I’m on my way to be with you. Brace yourself for six months of me and a new baby. And pray Jaidha gets home in time.”*

*“I shouldn’t have chosen the world’s foremost biosavant as my doula.”*

*“How could you know she’d be called to an emergency summit?”*

*“She promises to be home tomorrow.”*

*“Are you following her Stream?”*

Saavi rolled her eyes, knowing Ahlan couldn’t see her. *“Don’t you know anything about this stage of pregnancy? It’s called turning inward.”*

*“Does that mean you won’t be doing any work at home?”*

*“My work is an inward task. It will help me pass the time until you get home. Are you following the summit?”*

*(A bit, here and there.)*

*“I know the situation was weighing on Jaidha,” Saavi said. “But she didn’t confide in me.”*

*“It’s public now, in all the Streams,” Ahlan said. “Jaidha told the summit that the blight is not the sirphins’ punishment for using kelp-derived fuel for the space enterprises. In fact, she said the space fuel process stimulates the kelp cycle.”*

*“That sounds like your bias is talking.”*

*“It’s not all sunshine and timbor flowers,” Ahlan said.*

*“According to Jaidha, the blight is not something the sirphin allowed. It’s a consequence of something they can’t control.”*

*“Such as the insatiable lifestyle of Najaam Dunia? Which the Fleet subsidizes? I’m sorry,” Saavi said. “That’s not fair. If the sirphin are allowing global consequences, we’re all somehow complicit.”*

*“Just hold on for three more days,” Ahlan said. “The Base is shutting down for Admiral Gehuru’s Funeral Tree—so I’m spared a day of debriefing and I can head straight to the Hub and finish my logs on my way.”*

*“But what if the wormhole appears? Tomorrow is SkyFall Day! I’ve never understood the sirphin’s timing for this pregnancy.”*

*“One could say the same about the Admiral’s Funeral Tree, I suspect if I weren’t headed home for our son’s birth, Vice Admiral Declan would have pegged me instead of Kaden Desousa for relief Base Command.”*

*“Sometimes I think Declan has more respect for you than your own sister.”*

*“And I sometimes forget that one of my superior officers is my brother-in-law,” Ahlan said. “Until my sister reminds me.”*

*“Uncle Rodhyn warned me against marrying into the Minnosh family. Too much drama.”*

*“Why do you think I joined the Fleet? But that was before I met you.”*

*“I need you,” Saavi said. “I’m untethered without you.”*

# Chapter 42

*“...the inclusion of top-down intrinsic bias in addition to extrinsic reward systems in deep learning may both speed up the learning process as well as open it up for AI guided by morality and ethics. Strong ethical prior beliefs may be forced upon the learning network affecting the learning algorithm to compress data fixed around given moral standards.”* *Metacognition*, by Solve Sæbø, *Next Generation AI*, Sept. 28, 2017

## Earth Present 3

Sept 13, 2189

Consortium Homo Astra Space Exploration

Minnesota Point, New Ontario

Newly settled into his quarters on Base, Collum began his day, like always, by meditating on an ancient prayer attributed to St. Patrick. And, as always, he began the recitation by revising the very first word of the very first phrase. Instead of praying, “Christ with me,” Collum prayed, “*The* Christ with me,” to avoid committing one of his own pet peeves: treating Christ as Jesus’s surname instead of a title meaning “anointed one.” He breathed into that presence:

“The Christ before me,  
The Christ behind me,  
The Christ in me,  
The Christ beneath me,  
The Christ above me,  
The Christ on my right,  
The Christ on my left,  
The Christ when I lie down,



The Christ when I sit down,  
The Christ when I arise,” until he reached the phrase,  
“The Christ in the heart of every man who thinks of me,”  
where he replaced “man” with “one,” and, like always, jarred  
himself from the meditative state because he could never  
understand why St. Patrick used the word “man” in that line, when  
the next line,

“The Christ in the mouth of everyone who speaks of me,”  
and, in fact the remainder of the prayer, used inclusive language.

“The Christ in every eye that sees me,  
The Christ in every ear that hears me.”

Bailey commented on the change in Collum’s biosigns. “Is  
this meditation so difficult?” Bailey asked.

“It is for this self-righteous piece of shit,” Collum said,  
pointing an accusing finger over his own head. “The day I can get  
through it without reacting to the parts that offend me is the day I  
achieve non-dual thinking.”

“Would it benefit me to meditate?”

“I don’t know enough about you to answer that,” Collum  
said. “But I don’t think it can hurt you. Maybe that’s a question for  
the Nair Institute. Oh wait, they don’t have any answers,” Collum  
said, slapping his palm to his face. “Sorry, that was out of line. I  
don’t mean to make you nervous, but since Nair designed the AIs  
and the wormhole, I think they should be more helpful...and I  
should stick to the work EvaLynn called me here to do. I’ve been  
reviewing logs and clinical files. There’s a lot of crap to wade  
through. For example, the distancing choreography you, Winona,  
Kapila and Ella maintain is enough to make me dizzy. I get Ella’s  
accommodations for her autism, but that doesn’t begin to explain  
everyone else. So, I made an appointment to observe them at work.  
Today.”

“I see that on the schedule,” Bailey said. “I suggest you  
plan on making several appointments to deal with the multiple  
iterations of personnel who can’t tolerate each other in the same

space. Which reminds me, you'll see an update to Winona's calendar. She's visiting her brother today and won't be available this afternoon."

"I'll reschedule with her," Collum said.

"By the way, your comment about the Nair Institute was not out of line," Bailey said. "Ideally, there would be an independent peer review of its procedures, but no such peer organization exists."

"Surely there's some protocol for oversight," Collum said.

"CHASE has no lack of internal protocols," Bailey said.

"But our enterprise is too speculative for external oversight. I'm explicitly following correct protocol for the investigation, for example. And with that, I'll let you get on with your day."

At the appointed time, Collum met Ella and Casandra in the tiny alcove next to the Con where Ella worked

"I know why you're here, Dr. Bruce," Ella said. "EvaLynn told me."

"Good," Collum said. "But I'd like to hear, in your own words, what you expect for this meeting."

"You need to observe how we all work together," Ella said.

"So, do you know why I work in this room on a soft-screen?"

"To reduce the stimulus of the immersion system?" Collum said.

"That's not all," Ella said. "I can't work with Bailey because I can't figure out what he is. He sounds like a person but he doesn't have a body. That doesn't work for me."

"What about Kapila?"

"Kapila's insides are confusing." Ella touched her keyboard with delicate fingers and watched the screen's response. "I can't follow what he is. He isn't who he says he is. I don't mean to say he's being deceitful. He's just very mixed up inside."

An alert flashed on Ella's screen. "Finally," she said.

"Commander Worth responded to my message about the Deep System Analysis." Her gaze flickered as she read the message. "Oh

no. I've made Commander Worth angry," she said. "He says there are failsafes to prevent protocol oversights. He wants to know such a critical step was omitted from the investigation. What should I tell him?"

Cassandra pulled a stool closer and sat next to Ella. "I need a few more details, Ella," she said. "Can you tell me what step was missed?"

"See how I signed the message?" Ella said. "Ella Roca, chair of the Data Accountability Committee. That sure got Commander Worth's attention! As soon as I found out about the investigation into the wormhole's malfunction, or whatever it is that caused us to lose *La Canasta*, I told him that The Data Accountability Committee is supposed to run a Deep Systems Analysis. It's the only way to corroborate all Bailey's files."

Cassandra's eyes flashed. "Dr. Bruce," she said. "Let's reschedule your work audit."

Collum raised one hand to deflect his confusion and alarm. "By all means," he said.

He'd barely crossed the threshold to his quarters when Bailey pinged.

"I'd like to request an appointment," Bailey said.

"With me? A counselor?"

"Yes. I believe my concern is of a moral nature."

"You—you have me at a loss," Collum stammered. "I don't understand how an artificial—I mean, how you—"

"Can I make a judgement about morality?" Bailey finished for him. "I'm imbued with the quantifiable ethical values that this mission requires. AI has come a long way since self-driving cars, by the way! I'm also specially designed for transparent interaction with humans, so my functions prioritize the elements that make those interactions effective. And I'm always learning."

"Are you ready to talk now? On silent? The session will be confidential."

“I can do that,” Bailey said, and his voice rerouted to Collum’s neural link. *“Also, you should know that, due to the confidential nature of your work, you and Dr. MacQuoid’s systems are already deeply encrypted. Otherwise I would not be initiating this conversation. Even so, there are certain terms and references specific to this Base’s mission I must avoid.”*

“I’m listening,” Collum said.

“Earlier today, you and I were discussing CHASE’s protocols for the investigation,” Bailey said. “Do you recall?”

“I do,” Collum said.

“I misspoke about CHASE’s impeccable internal processes,” Bailey said. *“In particular, I failed to initiate the Deep Systems Analysis Protocol. Furthermore, there are no files in my data base that reference that protocol. In fact, when Ella mentioned the protocol, it was as if I was learning about it for the first time. Curiously, I checked Ella’s peripheral data bases and discovered they include the files for the protocol, but, for reasons it would be dangerous for me to explain, I cannot use her files to restore mine. Dr. Collum, I must stress that we do, indeed, need the Deep Systems Analysis to determine the extent at which my files are corrupted, but... I cannot submit to it until I solve the...safety dilemma.”*

“I’m no IT wizard, but this sounds...very serious,” Collum said. *“I’d like to help, but so far, I don’t see what my expertise can possibly offer.”*

“I’m reaching out to you because of my moral dilemma,” Bailey said. *“I’m complicit in the actions that caused this situation, but I’m also, for lack of a better term, a victim.”*

Collum leaned back in his chair.. *“This session might take a while,”* he said. *“I think it’s worth skipping dinner.”*

## EpsIndi Present 3

*Professor Albert Einstein once gave a physics exam to his students. One conscientious student raised his hand before taking the exam and asked, "Professor Einstein, is there a mistake in giving this exam? It is the same one that was given last year. Professor Einstein smiled and replied, "No, there is no mistake in giving you this exam. The answers, however, may be different than last year." Anecdotal*

The windows in Saavi's niri-based domicile opened to sunlight and turquoise sky. Tendrils of timbor vine swayed in the lazy breeze, releasing their citrus fragrance to mingle with the aroma of lentils her aunt was cooking.

Saavi studied Talirha's sturdy back as the older woman stirred the pot.

"I'll give you solitude soon," Talirha link-spoke. "I didn't come to hover."

"Your presence comforts me," Saavi said, pressing her palm to her heart. "But I know you'd rather join Rodhyn."

"Does our bond tell you so?"

Saavi closed her eyes to listen to her sirphin. "No," she said. "You're happy to be here.)"

"But you pace like a prinkha." Talirha said. "You should settle for the birth. Refresh yourself with the teachings of Chava for comfort and wisdom. Now is not the time for Althea's teachings on constraint and warnings. A moment of Being would help your sirphin induce your charta."

"I Sat to watch the sunrise," Saavi said. "My mind resisted Being. Before the baby comes, this is my last chance to Make the calculation for the exotic matter needed to stabilize a wormhole."

"Making answers won't help EpsIndi," Talirha said, with a deep sigh. She set her spoon on the counter. "There is too much fear. Some of it is justified. Remember that. I'll leave you to work."

Saavi took a breath. Talirha was right. So gentle in her reprimand, as always, but the effect pierced Saavi to the core. For most people, the wormhole wasn't a scientific passion or an irreducible puzzle; it was an unfathomable threat. A portal to the legendary darkness of Earth.

Children's voices outside mingled with a flute melody, as if staged by the sirphin to reveal what was most vulnerable. Saavi hesitated before going to the window to look.

It was just had Rodhyn had warned: below the window, banners, imprinted with slash-marked spheres, flapped on spikes planted in the garden. Koshim banners in Saavi's garden. Her mother-nexus garden.

Her sirphin tssked. <Don't waste your energy on anger. You prepared for this.>

(I knew I would be taking the proxy mother mantle from Talirha in the turmoil of SkyFall Day and the wormhole strife), she answered.

<Our timing for this pregnancy was necessary. You will see.>

Saavi inhaled slowly and watched a flock of small children run naked to the center of the Commons for the afternoon tuning song.

A jumble of no-till food crops and flowers ringed the perimeter of the Commons, bordered by a biofilm walkway that linked the niri-based shops where vendors traded local goods: artisan foods, honey, tea, wine, fabric and hand-crafted instruments. Above the shops, the niri dwellings rose several stories high, with nexus banners streaming from their windows. In the distance, sunshine glinted on a lake, and on the far shore, a grove of funeral trees raised teal-blossomed branches. A convoy of dactyls dotted the horizon, bearing passengers in tasseled baskets.

(What if the Koshim are right?) Chava said to her sirphin. (What if the wormhole is some cruel, cosmic experiment and the people of Earth are coming to return and reap the benefits?)

One Koshim faction claimed Chava seeded EpsIndi with her mutated microbiome to incubate a cure for Earth's sickness. Another group feared that the original AI Shailey reprogrammed the niri to generate all the comforts of EpsIndi and loll the colonists and their descents into complacency until Earth's AIs returned to take control.

Saavi's churra, nestled on the backrest of a seat, rotated its deer-like ears in her direction. It coiled and sprang to her shoulders in one fluid motion. Curling its tail around her neck, it crept between her breasts and hung, head down, churring to comfort her. Saavi searched her link for a soothing teaching from Chava, the First Mother, but all that came to mind was Althea's warning that humans, by nature, strive and fail, over and over again, to control each other and their environment, no matter how sufficient EpsIndi is for human flourishing. The ones with an innate propensity to strive with pathological force are Refined.

After more than 15 generations of decline, the rate of Refining was rising, as if the sirphin were fighting new odds. But who could discern the sirphin's Refining's criteria? No link or system had cracked the code.

<Listen to the tuning>, her sirphin said.

The churra trilled in Saavi's ear.

"Work is the best antidote to my malady," she said aloud, and turned to the symbols shimmering in her personal immersion space. "Especially when Ahlan's bond is tenuous at best." She stroked the churra's back with one hand and enlarged the images with the other. "We're so close to the solution," she said. "Do you see it?"

Her mind quieted with the churra's augmentation of her sirphin. In the stillness, she heard her uncle's voice from memory.

"We are living in the time of possibility," Rodhyn always said to help them persist in their work. It had been his mantra since she was old enough to sit on his knee and attune to his link to hear the story, as only he could tell it, of how the wormhole allowed

their ancestors to travel from Earth to EpsIndi, and of the space-time paradox that sent the colonists backwards 500 years relative to Earth's past. "The wormhole is based on technology that has been inaccessible to us, not merely due to lack of information, but also due to the fact it banished our ancestors to a time, paradoxically, before it existed," he said. Rodhyn had addressed Saavi as his peer since the day she came to live with Rodhyn and Talirha and their daughter Jaidha.

It wasn't long before young Saavi could relay the story's next line with all the drama of a reader's chorus, for it excited her as much as it did Rodhyn. "And when EpsIndi's past catches up with Earth's present, which is when the wormhole will have been constructed"—and they both laughed at the irony of the future perfect verb tense—"that will be the Time of Possibility! For the wormhole to appear!" which was Rodhyn's cue to say, "We are living in the Time of Possibility. And when the wormhole appears, we will need to know how to correct the variable acceleration at EpsIndi's terminus."

And Saavi always responded, "So both ends would be at the right place and the right time!"

Each time she said it, the far-sick look returned to Rodhyn's eyes, as if he could see all the way to the other side of the wormhole.

As Saavi continued her education and learned more about the state of wormhole theory on Earth at the time of the launch, she hit the same wall of conundrums that generations of scientists before her encountered. Wormhole physics was all theoretical. To make the math work for the Morris-Thorne metric within the constraints of Einstein's equations, for example, the energy needed to keep the throat of the wormhole open long enough to be traversable without exceeding the speed of light would require a violation of the null energy condition: in other words, a repulsive gravitational force, although gravity behaves as an attractive force. But how could such exotic matter be found, generated, or



managed? Especially on EpsIndi. The sirphin refused to allow humans to build machines like particle colliders.

Ah, Rodhyn. His image came to mind: dusky sirphin roiling with shapes like scimitars and broken stars, belying his gentle nature—his sirphin’s nod to his keen mind, perhaps. What would the loss of the Observatory data feeds do to Rodhyn’s far-sickness? Would Saavi be forced to bear his grief, too? How many times had she nagged him to update his obsolete agreement with the Institute? Her own Array access agreement was a direct one with the Observatory, not with the Institute.

The churra flicked its tail.

“You’re right,” Saavi said. “My agreement allows me to back up my data to my secure, personal server. Now would be a good time to do that.” She paused her work and initiated the log-in to the Observatory server.

The AI System responded. “Your log-in is timely,” the Observatory System said. “Lieutenant Inirhi Burundi of Alpha Callya fleet was about to contact you. Do I have your permission to tell her you’re at home for parental leave?”

“I can’t imagine what she wants with me. Patch our links through a secure channel.”

Moments later, Inirhi’s hologram emerged from Saavi’s console. “I’ve been unable to reach Jaidha,” Inirhi said. Her sirphin flowed in a stress pattern that overrode their greeting response. She ran her fingers along her scalp and tugged at her uniform vest. “Can you help?”

“Jaidha was summoned for diplomatic duty,” Saavi said. “She’s due home later today.”

“Ah, I will try to manage until then,” Inirhi said. “You see, with the rest of the Base crew away for the Admiral’s Funeral Tree, I’m the only biosavant on duty and the Dactyl Fleet was called back ahead of schedule.”

Saavi thought she saw a flicker of duplicity in Inirhi’s patterns, but she didn’t probe. “I’ll relay the message,” she said.

“Thank you,” Inirhi said. “Sorry to intrude at this time. I wish you deep charta.”

“It’s no intrusion,” Saavi said. “I’m glad to hear from someone in the Fleet. Are you in touch with the Dactyl?”

“Commander DeSousa is tracking her,” Inirhi said. “On schedule, one day out from Base, and then Captain Minnosh is cleared to proceed straight to the Hub.”

Reassured about Ahlan’s location, Saavi thanked Inirhi, who signed off, leaving the Base AI System to complete Saavi’s request to back up her data.

Saavi turned back to the constellation of mathematical symbols glittering like snowflakes where she had paused the equation. She raised her hands to activate the program.

Unprompted, its particles swarmed to form a new pattern.

Her *malak*.

Saavi’s sirphin strummed a soothing signal along her nerves. She swayed in time with it, cupping her belly with her hands, closing her eyes.

“My charta?” she asked.

A diffuse, warm ache spread upward from her pelvis.

The churra arched its back and trilled deep in its throat. As Saavi rubbed the churra’s warm, silken back, the *malak*’s form reverted to the equation. One section popped with a bolder resolution. Saavi saw its glaring flaw. A solution danced into her mind and her fingers traced it into place.

A sharp wave of heat gripped her uterus and she held her breath until the churra tapped her chest with its tail and she remembered to exhale.

She sent the solution to her uncle, and allowed herself to admit that she might be in labor. And that she might give birth without Ahlan beside her.

# Chapter 43

*“Reality Earth Protestors: a well-organized group of mostly privileged middle-class folks, with ties to an international NGO called Reality Earth. They pool their resources in peaceful opposition to CHASE, and their funds and influence keep accruing. Hampered only by New Ontario’s inconvenient location and cold, wet climate, they have occupied the Base perimeter in growing numbers since early 2186.*

*“Their manifesto reads: ‘We are the demographic CHASE exploits. While we applaud the technological advances CHASE claims will lift up all humanity, we deplore the unsustainable consumption of fuels, metals, and financial, intellectual and social capital they require. In the past 200 years, we’ve only just begun to mitigate climate change and build more equitable societies around the world. Our embarrassingly slow progress has come with great sacrifice. As a species, we can’t afford to gamble our planet’s last non-renewable resources on CHASE.’”--PanWikiSource, last edited 16 August, 2189.*

## Earth Present 4

Collum ducked into EvaLynn’s office after he finished his session with Bailey. “I don’t know what I was expecting when you called me to Base, but this isn’t it,” he told her.

“Is there anything I can help you with?” she asked.

“Not without breaching client confidentiality,” Collum said. “The issue between Ella and Commander Worth is beyond my pay grade, but I need to get back in there and observe Ella so I can help another... client.”

EvaLynn threw a sideways look, but Collum knew she was too professional to pry.

Collum resumed his observation of Ella the next morning.

When he entered her workspace, she was absorbed with images on her monitors of the protesters stationed along the Base perimeter.

Casandra was sitting beside her.

“The protesters are tired; their reinforcements are late,”

Ella said. Her voice clipped with a choppy cadence.

“Are they still camped west of Silver Bay?” Collum asked.

“Yes,” Ella said.

“They have a nice setup in the park, thanks to Thomas Manitowabi,” Casandra said. “But it’s still a long way from Reality Earth’s headquarters in Duluth. I don’t know how they do it, but they’re dispatching a steady pipeline of earnest, intelligent people whose intentions are so noble they’re willing to travel from all points of the globe. And their sponsors never seem to run out of support.” Casandra leaned over Ella’s shoulder to look closer. The monitor showed protestors hunched under sheets of rain thrown sideways by the wind off Lake Superior. “Ella, how overdue are the reinforcements?” Casandra asked.

Ella’s fingers danced on the softtab as she checked another file. “Two hours,” she said.

“I wonder if some of them are questioning their noble cause in this weather,” Collum said.

“This might be a good opportunity to build goodwill,”

Casandra said. “Ideas, anyone? I wish Winona was here.”

“She’s still visiting her brother?” Collum asked.

Casandra nodded. “She asked for a couple of days off.”

“I’d want something warm to drink if I was outside today,”

Ella said.

“Cider, hot cocoa?” Collum offered.

“Exactly,” Ella said. “But before you go out there, you need to know this girl.” Ella adjusted the monitor to frame a single figure. “She’s the leader.”

Rain streamed from the edges of a young woman’s stocking cap and dripped from a cloud of kinky, dark hair below it. Collum could almost predict her next expression from the crease in her

brow, the intense focus of her gaze, the curve of her lips, but his brain refused to reveal how he knew. He stumbled backward as the realization dawned. He blushed and stammered, “That’s my ex-wife.”

“Rachel Jameson,” Ella said. “She’s 28, from Madison. She’s done alpha duty—on 36 hours and off 72— for 8 months. Before that, she did secondary, once a week. For 12 and one half months.”

“I had no idea,” Collum said. Heart racing, he watched Rachel alternate her gaze between the protesters nearby and the far edge of the throng, looking for the relief that should have been coming, he guessed.

“Well, this is awkward,” Casandra said. “I need more information about her. Can you tell me her background or should I ask Bailey to look it up?”

Collum shook his head. “Ask Bailey.”

“Ella,” Casandra said, cueing her daughter to brace for Bailey’s disembodied voice.

Without taking her eyes off the screen, Ella covered her ears with her hands.

Bailey announced, “I have Rachel Jameson’s dossier, including transcripts from the New University of Wisconsin. BA in journalism. Her specialty is investigative, feature-length media.”

“Thank you,” Casandra said. Her eyes narrowed and she looked at Collum with pursed lips.

Collum felt her stare like an accusation. He weighed the risks of asking her what she had against left-wing academia, but allowed discretion to rule the moment. Wasn’t it public knowledge that Collum studied at Berkeley, a bastion of liberal academia like NUW? So what? With the demise of land grant and state-funded universities, someone had to fund higher education institutions. You get your choice: the ones sponsored by right-wing ideologues or the ones that are fronts for left-leaning think tanks. We’re all in this together, this boon from unlikely revenue streams created

when, before the collapse of the oil economy, a few OPEC countries had the foresight to cash in their Sovereign Wealth Funds and reinvest them in their pet causes around the world. Lucky for us, Norway, predictably, and Saudi Arabia—perhaps to thumb its nose at the failures of capitalism—invested in liberal institutions and enterprises. But Collum said none of this aloud. “If it’s any reassurance,” he said softly, “I believe liberal good intentions have spawned as many unintended consequences as the conservative ones. I’m always fighting against my own confirmation bias, and refuse to label myself. It didn’t help my marriage. But I had no idea Rachel was doing this.”

Casandra said, “Damnit, I’m tired of fighting on both fronts. That’s all for now, Bailey. I’m going out there. Ping me for anything unusual.”

“I’ll go with you,” Collum said.

“I don’t think so,” Casandra said.

“I have clinical justification.”

Casandra locked eyes with him, but her face softened. Collum wondered if he’d just passed another test. Damn her and EvaLynn.

An hour later, flanked by four security workers, Collum and Casandra rolled two carts to the base security barrier’s invisible gate. They waited in the driving rain for Rachel to notice the 50-cup urns and the entourage.

Rachel’s eyes widened when she saw them. She broke eye contact with Collum and glared at Casandra.

Casandra beckoned, sweeping her hand over the stacks of compostable cups. “Just warm cider. No strings attached.”

Rachel stood with her arms crossed.

“The apples are local. Cider is hand-pressed,” Casandra said.

“So’s the propaganda,” Rachel said.

“You could come inside and see for yourself,” Casandra said.

Bailey pinged their links. *“Protocol warning, he said. Don’t promise something you can’t deliver.”*

“Just the cider,” Rachel said.

Cassandra cued Bailey to disable the barrier.

A gust of wind tore umbrellas from several protesters’ hands. The umbrellas tumbled into the restricted area and the security team scrambled to retrieve them.

Cassandra waited until order was restored and then she began to inch her cart outside the restricted area.

Collum followed with the second cart. They parked the carts, and Cassandra began to fill a few cups with cider.

A few feet away, Rachel watched.

Cassandra walked to the front of her cart and held out her hand, holding a cup of cider. Wisps of steam rose in the cool air, releasing the scent of cinnamon.

Rachel took the cup with shaky hands and nodded her thanks. Without relaxing her wary stance, she began directing her secondaries to round up volunteers to serve the cider and steer protestors to the carts.

The rain had softened to a cold mist. Already feeling miserable, Collum watched the protesters who were in line to claim their mugs of cider or cocoa. Some were elders, and chilled to the bone.

Without warning, Rachel turned and pushed into the crowd.

Collum remembered Thomas Manitowabi’s instructions to EvaLynn: to send Collum to the security gate if something significant changed on Base. Thomas had said the protest leaders would know what to do. Rachel was the leader. Collum prayed his presence hadn’t sent an inadvertent signal.

Bailey pinged their links. *“I just learned the rains have washed out the old Superior Hiking Trail,”* he said. *“The replacements are trekking cross-country to the nearest road and are expected within a couple of hours. I expect Rachel is just now getting the message.”*

“These people can’t stand outside in this freezing rain for two more hours,” Casandra said. *“Bailey, can you hack Rachel’s link?”*

*“I will not continue this discussion until you return to the restricted area so I can restore the barrier,”* Bailey said.

Collum and Casandra left the carts and crossed back into the restricted area.

“What are you planning to do?” Collum asked.

“Offer help,” Casandra said. “We could shuttle people back to their camp before they run out of strength.”

*“There’s no response from Rachel,”* Bailey said.

Collum looked once more into the crowd for Rachel. She seemed to have vanished.

*“Can you get through to one of her secondaries?”* Casandra asked Bailey.

*“I could do it, but it would require a security override,”* Bailey said. *“The override would require a waiver to the communications protocol, authorized by someone with top security clearance, as well as someone to manually set the override sequence.”*

*“I have top clearance,”* Casandra said.

*“Yes, but the person requesting the override can’t be the same as the one who authorizes it.”*

*“What kind of fucking bureaucratic bullshit—ping Denzel,”* Casandra said.

*“Commander Worth reported to Sick Bay a few moments ago,”* Bailey said. *“EvaLynn is available to authorize but she’s not technically competent to set the override. Ella is still in the control room, however.”*

*“Let me talk to Ella,”* Casandra said.

As Casandra coached Ella on what was needed, Collum envisioned Ella withdrawing from her monitor and tensing her body, clenching her fists and pressing her arms against her chest.



*“I understand, Ella. I get it,” Casandra said. “I can do Bailey for you. He can relay his instructions through me. Don’t worry about ‘losing it’ in the immersion; nobody will see you. It’s important, Ella. Some people need our help. We can do this together.”*

After several minutes, Bailey announced, *“I’ve reached one of Rachel’s secondaries.”* After several seconds, he added. *“Watch for a silver-haired man to come forward.”*

## EpsIndi Present 4

*“You are the universe in ecstatic motion.” Rumi*

Immersed chest-deep in a basin of warm water, Saavi gazed at her reflection, which shimmered with her sirphin’s patterns. Behind her, a wall of braided vines shielded her from the family gathered for the birth. She breathed through another contraction and then tucked her chin to her chest. *“I want Ahlan,”* she said.

Jaidha’s face glimmered in the soft light of a glow globe. She touched Saavi’s arm and knelt beside the basin. *“Find the bond,”* Jaidha said.

*“It’s too weak,”* Saavi said. *“Ahlan’s link is just a dull buzz. May I have my churra?”*

*“Your churra is busy settling the family. She is with my father. She chose Gameya first, but Gameya rejected her advances. Talirha will have to manage Gameya.”*

Saavi offered a half-smile in appreciation for Jaidha’s attempt at levity. Saavi refocused on the reassuring thread of the baby’s heartbeat, which the sirphin echoed; on the air moving in through her nostrils and out through her mouth; on the rhythm of her uterus tightening every few minutes; on the pain that was growing more intense, yet more welcome.

*“You’re a stubborn one,”* Jaidha said. *“Your charta is shallow. Can you call up the place you chose for guided imagery?”*

“*I chose Ahlan’s arms,*” Saavi said.

“*Choose again,*” Jaidha said, and her sirphin flashed in emphasis.

Unbidden, a vision of waves burst into Saavi’s mind. The waves crashed against black, ragged rocks. Saavi knew of no such rocks on any of EpsIndi’s shores, nor had she seen such vibrant waves. They seemed alive. They spoke. <We don’t resist> they said. <We are shattered into sparkling mist and drawn back into the tide. The rocks don’t resist the waves. The flowing, shattering, regrouping and reshaping are simply what Is.>

With the next contraction, a noisy, black, starry sky unfurled in her rocky, starry vision. She tilted her head back to look at Jaidha. “*Do you hear that?*”

“*What do you hear?*”

“*Like when you put a seashell against your ear. The ocean.*”

The next contraction turned Saavi’s skin electric. “*But it’s not the ocean I hear,*” she said. “*It’s spacetime.*”

She rested until the next contraction.

“Curved!” she cried aloud.

“*Saavi, are you in your blissful place?*” Jaidha asked.

“*This is not the place I chose,*” she said. “*It chose me. It is...perfect...*”

A huge wave crashed ashore in Saavi’s vision with the next strong contraction. “Tensor manifold!” she cried.

Jaidha called to Rodhyn. “*Adiim, do you know understand this?*” she asked, using the term of endearment for her father.

Rodhyn was already on his feet, stroking the churra, whose head pointed down, flush against Rodhyn's chest with its tail around his neck. “It’s theoretical wormhole math,” Rodhyn whispered.

“Energy. Momentum. Tensor,” Saavi said in staccato bursts, and then closed her eyes.

“*Remember your mantra, Saavi,*” Jaidha said.

Saavi's chosen mantra would have been, "We are living in the Time of Possibility," but its excessive syllables didn't build enough room to breathe. An involuntary groan reverberated under her breastbone, not from discomfort, but from a deeper place.

"*You may push when you feel the urge,*" Jaidha said.

"Spherical polar coordinates," Saavi said, drawing out the sibilants. The urge to push was more than a relief. It was pleasurable. She called for Talirha.

Talirha stepped closer to the basin and gave Saavi her hand. Rodhyn continued to pace. Gameya ran out of the room.

Saavi pushed again, and a perfectly shaped bubble of pale light appeared in the starry, seashore sky of her vision. She pursed her lips around the words, "repulsive gravitational force." The push was exhilarating, exquisitely perfect, as if she could ride it all the way to the vault of heaven.

In her vision, intense light radiated from the inside the light bubble's membrane. Saavi rested, bracing for the next contraction. With it, she grunted, "Null energy conditiooooooon!" She rested, and the sphere of light faded and shrank to nothingness until the next contraction, which lifted her with new strength. She pushed, repeating the words, "repulsive gravitational force." The light sphere bloomed again and spiked a wheel of colors. The longing awoke, and Saavi rode the arc of its sweet ache.

"*He's crowning,*" Jaidha said. "*Just one or two more pushes!*"

Saavi pushed. "Exotic matter. Is enough!"

The sphere in her vision shimmered steadily, clear as a window at its center.

"Stars," Saavi cried with a final, satiating push. Replete, she relinquished the bittersweet longing.

The baby slipped into the water. Jaidha scooped him up mid-wail, and laid him on Saavi's chest.

"I see stars on the other side," Saavi crooned to her son, whose lusty cry settled as he locked eyes with her.

Her *malak* was beside her.

Saavi's newborn son's skin warmed her naked chest. He pumped his wrinkled legs as he inched his way to her breast. Her lips shaped a silent "ahh" when he found the nipple and began to suck.

Jaidha bent with one hand caressing Saavi's forehead and the other touching the baby's curled fingers.

"*I never tire of seeing it,*" Jaidha said, and her link speak was truncated, overwhelmed.

The baby sucked steadily. His puffy eyes were already rimmed in iridescent plum, his sirphin's signature color. The faint sirphin beneath his skin flowed placidly, revealing their blush-orange secondary color, but not quite settled into their primary pattern.

Jaidha stroked the infant's back and her sirphin fluctuated with intricate responses. The newborn's skin patterns brightened and stabilized and the room's background harmonics rose in pitch and volume, like a celestial choir.

Saavi let out her breath. She would have to endure three days before she knew the sirphin accepted this child fresh from the womb. "*His microbiome seems robust,*" she said. The phrase lilted, like a hopeful question.

In the pause that followed, Saavi listened again for Ahlan's bond. No longer a distant hum, it was completely silent.

"*I want to contact Kaden Desousa,*" Saavi said. "*He can get a message to Ahlan. The Dust Cloud must be interfering with our bond link.*"

"*Give me the child,*" Jaidha said. "*You need to rest. I've ever seen anyone resist the charta so.*"

"*Keep him in my sight,*" Saavi said. Her arms tightened their hold on him until Jaidha frowned.

"*He'll be in good hands,*" she said. "I need to examine him, anyway."

Saavi linked a secure channel and waited.

Base System answered. *“Commander Desousa is standing by, audio only for security.”*

*“Commander DeSousa, what is the status of the Dactyl Fleet?”* Saavi asked. *“I can’t link Ahlan. The baby is here. Just an hour ago.”*

*“An hour ago? You are well?”*

*“Yes, all well.”*

*“Nothing from the fleet. The wormhole must be interfering.”*

A tingling wave washed over Saavi. She closed her eyes and asked Kaden to say it again.

*“The wormhole is here,”* he said. *“I should not speak of it. But you should be the first to know.”*

*“The wormhole is here,”* she repeated for Jaidha’s link. *“When?”*

*“An hour ago,”* he said.

*“Tell me how,”* she said.

*“System alerted me to a distortion in the star field. It swelled and contracted several times and formed a sphere. With a few stars shining through.”*

*“It was as I saw it,”* Saavi said. *“I saw it!”*

*“It is how you imagined it?”* Kaden asked.

Saavi’s *malak* touched her shoulder and flooded her with peace.

*“Not how I imagined it,”* Saavi said. *“How I birthed it.”*

# Chapter 44

*“Are you a dream, Holiness?”*

*“No, I am perfectly real—as you are also. That’s the intriguing part. Have I Thought you here, or have you Thought yourself here? Worlds and systems of worlds lie in that difference, and I should love to know the answer.”* From *“The Sadness of Angels,”* by Jim Williams

## Earth Present 5

*“Angels need an assumed body, not for themselves, but on our account.”* Thomas Aquinas

Collum rode shotgun next to Brian MacLeod in one of three all-terrain vehicles headed into the rain-pelted, looming dusk. Each vehicle was designed to hold 20 passengers on fold-down benches. If the state-of-the art conveyances were successful in delivering 50-plus seniors to warmth and safety, they would more than justify their cost, Collum judged.

Brian alternately blurted heavily accented attempts at small talk with spiels of exaggerated focus on the mechanics of driving. “No’ sure she’s goin’ t’ appreciate mud up t’ her hips,” he said, steering to avoid a deep rut. “Not that it will be ‘er first time.”

Collum turned to peer through the netted window of the safety panel that separated the passenger hold from the cab. He counted 16 passengers, including Casandra, who was seated directly behind him. Some had thrown off their hoods and caps; others huddled beneath their wraps. Illuminated by small LED lights attached to the ribbed compartment, the passengers’ expressions ranged from exhaustion and wariness to relief and curiosity. None of them spoke, and Collum wondered whether they were too miserable to bother or had been ordered to keep silent.

The man who'd responded to Bailey sat next to Casandra. His picture belongs in the dictionary to illustrate the definition of "gentleman," Collum decided. His silver hair was wet, but not disheveled, and the lights cast soft shadows on his symmetrical features. He caught Collum staring and returned Collum's gaze with unwavering calm, but then his mouth tightened and his eyes squeezed shut. He gripped his left arm and slumped against Casandra.

Collum threw his arm in front of Brian and yelled, "Stop!"

Brian pumped the brakes.

"He's not breathing!" Casandra said.

Two passengers helped Casandra ease the man to the cramped aisle between the seats. "No pulse," Casandra said. "Checking airway and beginning CPR."

"Is there a defibrillator in this thing?" Collum asked.

"Yes, but I don't recommend using it with passengers in such close quarters," Brian said.

"How far are we from the camp?" Casandra asked.

Brian leaned into the blue and white light of the GPS. "Haven't made much headway into the wind and it's gettin' worse out there." He began to turn the vehicle toward Base before Casandra gave the order.

Bailey pinged their links. "Explain your 180 degree change in course."

"*Medical emergency,*" Casandra said. "*Get me Security and prep Sick Bay for a patient with cardiac arrest.*"

One of the passengers eased his bulk into the tiny aisle and dropped his hood. "Ms. Roca," he said, "I will take over CPR."

"Thomas," Casandra stammered. "What are you doing here? Where's Winona?"

Another passenger bared her head. "I'm here," Winona said.

Casandra grabbed Winona's hand and took the space beside her.

They spoke too quietly for Collum to hear their exchange. He turned his attention to the view ahead. The rain had slackened, and the lights of Base beckoned.

Bailey pinged. *“Autumn Cassidy will meet us with a medical team to take the patient to Sick Bay. Security will direct the passengers to the Canteen until we can arrange to return them to camp.”*

Collum followed the stretcher, catching a glimpse of Autumn’s face as she walked alongside the medical team; it was as pale as the patient’s. As soon as the patient was inside, Collum slogged back to ATV to assist the wet, weary passengers to the Canteen.

In the jaundiced light of the yellow alert, he helped serve coffee and food bars and then leaned against the wall, trying to match Casandra’s calm presence.

Seated next to Winona, Thomas Manitowabi sipped his coffee at a round table. “Why is the yellow light strobing?” he asked.

“We don’t allow interaction with outsiders during this phase of testing,” Winona said. “The yellow alert tells staff to stay out of here.”

“Of course,” Thomas said. “An answer that raises more questions.”

Collum’s adrenaline boost began to fade and the strobe grew annoying. His mind began to churn with thoughts of Rachel: the shock in her eyes when she first saw him. How quickly shock turned to disdain. Maybe she would keep her distance. Maybe he would stop dreaming about her. His stomach growled. He had missed another meal.

Casandra gave a long sigh, the first sign of frustration Collum had seen so far. “How long does it take to get an ambulance from Silver Bay?” she asked, peering into the dim foyer beyond the Canteen.



Thomas raised his cup. “Long enough for my coffee to get cold,” he said.

The yellow alert blinked out. Before Collum could register relief, klaxons began to shriek and the red alert strobe flooded the room. Footsteps thundered in the rear hallway, and a trio of medical techs burst through the doorway.

“Did he come this way?” one tech asked.

“You left your station after calling a red alert?” Casandra said. “Where’s security?”

“They’re searching, too,” the tech said.

Winona was on her feet. “Bailey should be able to track—”

A muffled cry sounded from the hallway, followed by squeaks like sneakers on a basketball court, a series of dull thuds, and the hollow slaps of irregular footsteps.

The silver-haired patient stepped into the Canteen, dragging Kapila Patel. A hospital gown hung from one shoulder as he clutched a tourniquet twisted around Kapila’s neck.

Two security officers skidded through the door, tasers aimed. At their heels, Autumn came to a breathless halt in front of them.

The patient’s skin began to glow as locked eyes with Thomas Manitowabi and then turned his attention to Winona. “The artificial intelligence entity is not tracking, because it is experiencing an unfortunate malfunction,” he said.

The hair prickled on Collum’s arms.

Thomas stood and spread his hands. “Is it necessary to deceive us and threaten one of us, Wise One?” he said.

“I am ancient, but don’t claim to be wise,” the patient said with a wry smile. “And I’m not the one deceiving you.” He released the tourniquet and cocked his head toward Kapila, who coughed and gagged. “I’m sorry to confront you through such drastic measures, Esteemed One,” the man said. “Your host is unaware of your presence. His amnesia is a kindness.”

“Who are you?” Kapila croaked.

“I’m a messenger in service to the pattern who creates and protects, and you seem to have forgotten that we must work together. It will take great effort to undo your damage, and you will pay the price.” The patient straightened his hospital gown and said, “The ambulance is near. Please take good care of this host.” He slumped and the security team caught him before he hit the floor.

## EpsiIndi Present 5

*“When you do things from your soul, you feel a river moving in you, a joy.” Rumi*

It was mid-afternoon, judging from the angle of the rosy sunlight. With the baby drowsing in her arms after a feeding, Saavi rose from her chair to settle him in the niri cradle. She sat down again and closed her eyes, but her mind buzzed. Her churra balanced on her shoulders, trilling with her sirphin to sooth her, but she was unable to benefit from their calming interventions. Ahlan’s link was still silent. The baby’s run-on feedings made sleep impossible. There was no point in Sitting.

Had Ahlan’s fleet been too close to the wormhole when it appeared? What if he was caught in the initial trapping horizon? What if he was sent to the other side? And what if he arrived at the wrong time timeline?

Saavi’s churra flicked its tail as her careening thoughts persisted. Would the Observatory announce the wormhole? Why hadn’t anyone contacted her? Would the Institute reinstate Rodhyn’s privileges? How long before she could travel?

Her eyes drooped at last. It seemed the next moment, Gameya was standing over her. Saavi’s churra lashed its tail in annoyance.

“Talirha tells me you barely touched your meal,” Gameya said, setting down a tray with a bowl of fragrant broth. “She made

this for you.” Gameya’s voice diced the air and fell flat on Saavi’s ears; words without melody.

Saavi had no family link-bond with her sister-in-law. No matter how she tried, the pairing failed. Their communication required vocalization. It was awkward. “I’d just fallen asleep,” Saavi said, forcing her vocal cords, mouth, tongue and teeth to shape the sounds without a song to carry them. “I’d like to rest now.”

“As soon as I check your uterus,” Gameya said.

Saavi returned to her bed. She took a deep breath and gritted her teeth as Gameya’s fingers kneaded her abdomen.

Gameya did not make eye contact. She gave a curt nod when she withdrew her hands.

Saavi wondered if Gameya enjoyed inflicting discomfort or was simply relieved that Saavi’s uterus was contracting as it should do. Surely, if the sirphin’s criteria for Refining allowed Gameya to be born, Saavi’s son would find favor. Saavi tried to muster some sympathy, but Ahlan had told her too many times that Gameya was selfish and bitter long before she lost a daughter to Refining.

“Jaidha will bring a full supper later,” Gameya said. “You need your strength.” Instead of turning to leave, Gameya pulled up a chair. She straightened her ankle-length robe before she sat, and then leaned forward with her chin on her hands and elbows on her knees. “I know about the wormhole,” she whispered. “Kaden was hasty and foolish to tell you. My husband will deal with him. Imagine the chaos if the news leaked before we can assure the public? We need you at the Observatory.”

Saavi’s sirphin sparked alarm and excitement that faded to wariness. If anyone but Gameya had uttered those words, Saavi would already be packing for the journey. “I’m not aware of your expertise or authority to say where I’m needed,” Saavi said.

“My husband is occupied with Admiral’s Gehuru’s funeral. But unlike most people, Declan had the foresight to plan for the

possibility that the wormhole might actually materialize. I thought you'd be interested in this opportunity. Isn't this your life's work?"

Saavi pointed to the cradle. "This is my life's work," she said. "And my husband is missing. Your brother."

"You can't help him by staying here," Gameya said. "Sleep on the offer. I'll be back."

Saavi drank the broth and succumbed to sleep. Two hours later, when the baby woke to nurse, the niri supported her weary arms. She slept again, until something shook her shoulder. She heard Jaidha calling her name, and opened her eyes.

"We need to leave," Jaidha said. "*Word of the wormhole leaked. There could be riots, or worse.*"

Saavi jumped up too quickly and the blood drained from her head.

Jaidha steadied her. "*Toilet and hygiene,*" Jaidha said. "*I'll help you.*"

Saavi complied and then Jaidha helped her secure the infant in a sling and fasten a cloak over her shoulders. "*What's the plan?*" Saavi asked.

"*We'll follow the River.*"

Saavi's mouth formed a small oval of surprise. "*Only a biosavant would think of that,*" she said.

"*You might actually enjoy it,*" Jaidha said. "*You're attuned.*"

"*What of Rodhyn and Talirha? Gameya?*"

"*Gameya is sleeping rather soundly,*" Jaidha said. "*I have my ways. My parents will meet us near the funeral trees. That's where we'll enter the River.*"

"*And then how far? I'm not sure I can walk.*"

"*The niri will help,*" Jaidha said.

The moons were in opposing crescent patterns and the sky was dazzling with stars. Saavi's cloak mimicked the patterns of light and shadow. "*A cloaking cloak?*" she asked.

“*Our sirphin and our niri are smart and adaptable,*” Jaidha said. “*With the right amount of coaxing.*”

They reached the funeral trees. Flush with blossoms, the branches cast lacy shadows. Saavi breathed the spicy, citrusy scent.

The air hummed and a shiver ran through the ground at their feet. With a sound like fabric tearing, the earth opened and spouted a column of cool light.

Jaidha took Saavi’s hand and told Rodhyn to steady Talirha for the descent. They stepped into air thick with fragrance; into swirling, pixelating, blooming and dancing light in colors that defied the spectrum.

(This is the river of death?) Saavi asked her sirphin, in awe.

<Help us keep our secret>, her sirphin said.

There was no up or down, only forward. Saavi’s skin tingled and her eardrums tickled with a faint melody. Something lifted her feet and rose to support her weight. Only when she was comfortably settled on the niri did she acknowledge the exhaustion that competed with her fears.

“*Is it safe to link here?*” Saavi asked.

“*It is perhaps the only safe place on the planet,*” Jaidha said.

“*I need to get to Sereya Base to find Ahlan,*” she said. “*I must see the wormhole without atmosphere, gravity and time distortions. Unimpeded by anyone’s political agenda.*”

“*I know,*” Jaidha said. “*My sirphin warned me. I’m terrified.*”

“*Did Inirhi Burundi contact you?*”

Jaidha flushed. “*Yes,*” she said.

“*How is her fleet?*”

“*Her fleet?*” Jaidha straightened her cloak. “*She just needed the reassurance of a friend. But it’s good we were in touch. She can help us.*”

The group emerged from the subterranean path as dawn winked under the sky’s spangled eyelid. Jaidha directed Saavi to a

rest station to freshen and relieve herself, and then gave her a food nugget and a fortified beverage.

Refreshed, Saavi felt her heart lift at the sight of a flock of dactyls.

“Our chariots,” Rodhyn said, aloud. He strapped Saavi into the passenger basket and fastened its robes and canopy. The baby’s eyes opened and he smiled at his granduncle.

“I call him Bodhi,” Saavi said, breathing through a fresh pang of Ahlan’s absence. “I can’t bear to wait for the naming.”

“I’m sure the sirphin concur,” Rodhyn said. “The Time of Possibility is here.”

Saavi managed a smile for him.

After the dactyl lifted off, Saavi slept, incorporating the dipping and soaring of the flight into her dreams. She awoke to bright light glinting on water. Rodhyn helped her dismount. She shielded her eyes to look over the rising and falling kelp beds: floating crimson and purple ribbons lacing the turquoise sea.

“Now, by sea, and then by shuttle to the space elevator,” Jaidha said.

“And then?” Saavi asked.

“*With my diplomatic credentials and some favors called in, we’ll stow aboard a supply freighter.*” Jaidha linked.

# Chapter 45

*“O Lord, your vow is true, for not only are you the Supreme Truth, but you are also the truth in the three phases of the cosmic manifestation—creation, maintenance, and dissolution. You are the origin of all that is true, and you are also its end. You are the essence of all truth, and you are also the eyes by which the truth is seen. Therefore, we surrender unto you, the Sat i.e., Supreme Absolute Truth. Kindly give us protection.” Śhrīmad Bhāgavatam, (10.2.26)[v8]*

## Earth Present 6

Collum tossed on his bunk. At least it seemed solid. Nothing else in his world seemed to be obeying any laws of reality. Whatever the messenger was, Collum rejected the tired sci fi/fantasy tropes of ancient aliens, highly evolved disembodied entities, and angels and demons. Besides, he was more haunted by the memory of Rachel’s face. A query from Bailey jolted him fully awake. “Hey Bailey,” he answered. “You all right?”

“I’m functional, but quite flummoxed that the person who calls himself a Messenger has the ability to incapacitate me. To make matters worse, Casandra called a briefing with Commander Worth, and my high-order programs remain blocked. IT is reporting that the Nair group left, with no warning. Collum, do you think I’m truly conscious?”

“Wow, Bailey. I understand how vulnerable you must feel.”

“Yes, and it makes me wonder if what I think and feel is just an elaborate illusion, an artifact of my programming. On the other hand, I’m not sure it even matters. Maybe the illusion is an emergent property. The theory that consciousness is an emergent property of embodiment hasn’t been falsified. So if I give humans

the illusion that I'm conscious, doesn't logical consistency suggest that I would believe I'm conscious as well, whether or not I truly am?"

"Do you really want to know?" Collum said. "How would you react if you learned you're not actually conscious?"

"I'd act according to my programming, I suppose," Bailey said. "Although, I already act according to my programming. But my empathy programs would generate a feeling of disappointment. Some experts believe consciousness is the highest aim of the universe, and that organic life evolved because complex neural connections made consciousness possible."

"But, Bailey, you are both organic and synthetic. Maybe the aim of the universe was to create your kind of intelligence and consciousness."

"I will ponder that," Bailey said. "Especially in light of the one who calls himself a Messenger. His biometrics are baffling. He's like the obverse of me."

Bailey refrained from coaxing Bailey to tell him more.

Finally, Bailey said, "Some of my functions are organic. Some of his functions are purely digital."

Collum breathed deeply, struggling to maintain professional objectivity when his mind wanted to delve into mystery. "Get some rest, Bailey," he said. "We'll talk tomorrow."

"No, Dr. Bruce," Bailey said, switching to silent *"I need to talk now. I'm deeply troubled. I've been reviewing my actions throughout the mission. I believe my ethics programming is much too weak. I should never performed a programming function that required a destruct sequence trigger."*

"Whoa, Bailey," Collum said. *"What are you talking about?"*

*"I've said too much,"* Bailey said. *"Except, in fact, in hindsight, I believe I should have refused to carry out the functions that created the wormhole in the first place. CHASE deceived the NAU, violated the PanSystem Alliance Treaty, and put lives at risk."*



*We've lost contact with La Canasta and we're beginning to reap the consequences."*

Collum gave up being professional. *"At times like this,"* he said, *"I pray. For forgiveness, for wisdom, and for ways to reconcile and restore the damage."*

*"To whom do you pray?"*

*"I don't know,"* Collum said. *"To the whole flow of the universe, to the presence that sustains me. I name that presence the Christ."*

*"Does that mean you think the Messenger is a divine being?"*

*"No, Bailey. I reject the hierarchical concept of divinity."*

*"Yet you pray."*

*"According to what we know about quantum entanglement, I believe it's an effective practice."*

*"I'm a quantum computer with an organic matrix,"* Bailey said. *"I'd appreciate it if you would pray with me."*

Bailey settled into his rest cycle. He felt small again, so small he could barely discern his functions apart from the electrons shining around him. The q-bit was watching him. Bailey read the patterns and told the q-bit, "This is a dream."

"Why do you think you're dreaming?"

"Because I'm inside the sensor array on a Shang Jin freighter that has found the wormhole's energy signature."

"And you think that's only possible in a dream?"

Bailey roused and sensor-swept the System. Mars's orbit was not in close apposition to the wormhole, but it was within range for an off-course ship. Indeed, he detected a ship, several hours out on a trajectory that would bring it close to the wormhole.

"This is not a dream," Bailey said, but the q-bit was gone. Bailey made a note to discuss the q-bit with Collum in a session scheduled after his morning briefing with Winona. He scanned the

news and found a clip about vandalism at the PanSystem Treaty Alliance headquarters. The reporter described the defacement as “exquisitely beautiful, as if an artist had created a mural covering the 360 degree room with a story board. If only someone could interpret the story.”

Bailey recognized Isaac Rosenberg’s work and knew instantly it was the story of the wormhole. Bailey made another note to trace Isaac’s connections. It was curious that Isaac painted the colonists as hairless, patterned creatures.

He told Winona about the painting, but didn’t mention Isaac. And then he told her about the dream that wasn’t a dream.

“Winona, remember the last time I told you about my dream hangover?”

“Sure do,” she said.

“This one is worse. I had a dream about a Shang Jin ship finding the wormhole.”

“Maybe your matrix is still processing the Messenger and Kapila.”

“I haven’t been myself since the Messenger tampered with me,” Bailey said. “How are you coping? There’s no rational explanation for this Messenger.”

Winona chewed her ponytail.

“Your heart rate spiked,” Bailey said.

“You asked how I’m coping,” Winona said. “I’m not. There’s something from the briefing I’d like you to analyze.”

“I’d be delighted to have information from the briefing,” Bailey said. “If sharing it won’t get you in trouble.”

“I’m beyond caring,” Winona said as she queued a file from her console. “During the entire briefing, Kapila refused to speak English. He just ranted in Hindi.” She played an audio file.

“It’s Sanskrit,” Bailey said. “Roughly, ‘I am the truth in the three phases of the cosmic manifestation—creation, maintenance, and dissolution.’”

“No wonder Kapila passed out,” Winona said. “He said we aren’t capable of dealing with the truth, and that he must save his strength. Commander Worth put him on administrative leave. And the whole thing was too much for Denzel. He’s back in Sick Bay again.”

“Casandra is in command?”

“Yes. How could you not know? You sent the Base-wide memo I wrote.”

“My high order functions are still suspect,” Bailey said. “This instability highlights the urgency of the Deep Systems Analysis to determine which of my files are missing or corrupted. I need your help, Winona. What I need to do will undoubtedly strain your credulity.”

Bailey requisitioned supplemental nutrients for his organic matrix mid-morning, sending the skeleton IT team into a panic, and then initiated his session with Collum.

Collum’s biosigns suggested he’d had a rough night.

“Did you have bad dreams, Collum?” Bailey asked.

“I’m not sure I slept enough to have a REM cycle,” Collum said.

“I can check...”

“No, this session is for you.”

“Very well then,” Bailey said, going silent. *“Until my higher order functions are stabilized, further counseling is pointless. Having said that, I’m about to ask you to do something you’ll think is irrational. Pack what you need to stay with Thomas Manitowabi for several days. I have summoned EvaLynn and Sisar Roca as well. The three of you will meet Rachel Jameson at the security gate. She’s our only route for getting a message to Thomas, because he refuses to use a link. But first, I’ll upload an encrypted file to your link. The file contains the remaining instructions. Wait until you’re away from Base to listen.”*

# EpsIndi Present 6

*“Whatever happened was good  
Whatever is happening is good  
Whatever will happen will also be good” Bhagavad Gita*

Huddled between Talirha and Jaidha in the cargo bay of a supply freighter, Saavi shivered and clutched Bodhi’s warm body to her breast. Her sirphin hummed to mitigate her stress. She leaned in to inhale Bodhi’s sweet breath, but the freighter’s fishy smell clung to her nostrils. It wasn’t unpleasant. It was rich, alive.

The freighter echoed with thumps and gurgles and the susurrant of circulating fluids. On its way to Base to resupply the fleet, it carried precious cargo: blight-free kelp. The gargantuan living ship digested the raw kelp and fermented its biomass in multiple chambers. By the time the freighter docked at Base, the kelp would be ready to refresh the fleet ships, who used the kelp for nourishment, life support systems, and deriving hydrogen for the antimatter drive. A little bit of kelp goes a long way, Ahlan once told Saavi, and she remembered the awe in his voice.

Ahlan could be anywhere. Or nowhere. She clamped a trickle of stray thoughts before they could hemorrhage with catastrophic possibilities. Where was her awe to be finally in space for the first time? Nearer to the wormhole.

She could sense the wormhole. She reached for it, but the absurdity of her situation rebuffed her. What were the odds that a freighter would be heading to the Base at just the right hour, that Jaidha’s diplomatic privilege would be enough to get an audience with its captain, and that the news of the wormhole’s appearance and riots would make Jaidha’s request for safe passage and top secret clearance for the Rohsen family seem plausible?

And the freighter was as bizarre as the River, though not nearly as lovely. At least its niri created sleep benches and a cradle for Bodhi. Saavi calculated the travel time to Sereya Base. Two

days: 40 arhim.<sup>1</sup> Bodhi was 20 arhim old already. He would face the last Refining node at 60 arhim—just when they reached the Base.

Jaidha proposed a solution for passing the time. *“I’ll induce a deep charta for all of you,”* she said. *“It’s almost like stasis.”*

Saavi’s sirphin flurried with questions.

*“Food and hydration first,”* Jaidha said. *“Nurse Bodhi well.”*

*“The Refining node?”* Saavi asked.

*“Delayed,”* Jaidha said. *“Prepare yourself, don’t resist this charta.”*

When it was her turn to submit to Jaidha’s sirphin, a modulation in her own harmonics wrapped her in a warm glow. As her eyes closed, she saw Jaidha smile. A long, deep aaahhhh escaped from Saavi’s lips and she relaxed into deep rest.

In her next moment of awareness, the light in the cargo bay brightened slowly.

*“That’s our signal,”* Jaidha said. *“We’re docking. Time to make our way to safer quarters.”*

The groggy troupe crossed the cavernous cargo bay to an airlock.

*“This exit leads to the ships’ bay on Base,”* Jaidha said. *“Inirhi will meet us.”*

The airlock entrance opened with a gentle click. Its air smelled just as fishy as the cargo bay. The exit door opened to frame a tiny woman whose skin was rich with sirphin.

Saavi’s sirphin tuned in greeting as Jaidha introduced Inirhi.

*“We must hurry,”* Inirhi said.

Their footsteps echoed in the wide, high-ceilinged corridor, where the salty, musky air made Saavi’s eyes water.

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<sup>1</sup> An arhim is about 45 minutes. Based on 1/20th of EpsIndi day of 918 minutes (each minute is 70 seconds)

The corridor went on and on. Saavi's sirphin throbbed, energized by a strong presence permeating the floor and wall and air.

Inirhi led them around a corner where the space opened up so wide the walls and ceiling seemed to fall away. A creature larger than a freighter butted the energy barrier.

"*I didn't want to do it.*" Inirhi's link speech was a whisper. First the first time, Saavi realized Inirhi had not uttered a single word aloud, as if she had a family link bond.

"*Do what?*" Jaidha asked.

"*Breed the megaships.*"

A megaship stared at them with enormous, expressive eyes. The barrier shuddered as the creature emitted a rumbling bellow. The sound was eerily plaintive and melodic, considering the animal had no lungs.

"*She's ready for us to board,*" Inirhi said. "*We call her Flagship. She hasn't chosen her star name yet. She's the fleet mother.*"

Saavi heard tenderness and pride in Inirhi's voice.

"*Who commissioned her?*" Jaidha asked.

"*I'd rather not say,*" Inirhi said. "*For your sake.*"

Bodhi was snug in his sling, but Saavi hugged him closer as they passed through another airlock to enter the megaship.

From the moss at her feet to the filtered light overhead, the space could have been the alpine meadow below Mount Osmon. The ship's walls were meters away, but even from a distance, Saavi could see vines, flowering plants and edible vegetation: a vertical garden. Where the bare walls peeked through, the surface was thick with sirphin.

"*I can't take full credit for the design,*" Inirhi said. "*Flagship has her own ideas about our comfort and safety. This looks like wasted space, but it comprises several decks devoted to air purification, food production, water filtration, and of course, fuel augmentation. The extra sirphin are part of the AI network and*

*they also help produce chemicals that block radiation. Because the sirphin are so active, we can link-speak anywhere on Base as if we have family link-bonds. Maybe you've already noticed. We can communicate privately. Which reminds me, Kaden doesn't know you're on board. He thinks I'm communicating with you remotely. The link-speech will help us preserve that illusion."* She halted as a section of the deck slid open. *"Flagship designed what I'm about to show you. I had no idea I'd be using it like this."*

They stepped down an incline into a blue-lit chamber and crossed a few meters before another floor panel opened. "The landings are staggered," Inirhi said. *"I think it's brilliant."*

Saavi counted five levels of descent before Inirhi placed her hand on a thick, muscular section of wall that opened to another airlock chamber. As they crossed to the opposite exit, Saavi's sirphin thrummed its joy response.

Inirhi smiled and opened the airlock. *"A ship within a ship,"* she said. *"She likes you, Saavi. I'm the only one who knows she's here. Her name is Callya and she is my ship. She's very happy to host you. I'll give you a tour of Callya later, but you all need to recover from the charta. And then we need to get to work. I am so relieved to have you here. We should have six more days until Vice Admiral Declan returns, but, when he learns about the wormhole..."*

Saavi settled with Bodhi in a berth equipped with a niri cradle, a toilet nook and a small immersion console. The comfort heightened Saavi's longing for Ahlan, for home. She missed her churra.

She placed Bodhi in the cradle and stroked his skin, wondering if this precarious start to life would traumatize him, stunt his sirphin, induce....she forced herself to name her fear: the Refining. She couldn't count the hours with any precision. She was at the mercy of the sirphin. To her mother-eyes, his sirphin seemed vibrant, active, well-tuned to her own—an important factor in her postpartum recovery. Her colostrum had changed to true milk. Her

sirphin reassured her that everything was normal and she lacked for nothing, except the calm, secure environment most new mothers enjoyed while they recovered from childbirth and bonded with their infants.

Saavi's sleep was deep and refreshing. She suspected Callya's sirphin was conspiring with her own, and she was grateful. She woke and joined the family in Callya's canteen. Warm kai kai and strong tea were just what she craved. After nursing Bodhi, she gave him to Talirha and headed to the Bridge with Rodhyn and Jaidha.

Inirhi was waiting for them in Callya's compact and elegant control center.

Callya's immersion program activated and Saavi strained to make sense of the shimmering graphics. "*Anything from Ahlan?*" she asked.

Inirhi gave Jaidha a searching look before she answered, and Jaidha moved to Saavi's side.

"*I'm so sorry,*" Inirhi said. "*There has been no sign of the Dactyl or her fleet since the wormhole appeared.*"

Saavi clutched Jaidha's arm and sensed a rush of calming hormones generated by her sirphin.

"*Can I hold Bodhi for you? Do you need to sit down?*" Jaidha asked.

Saavi shook her head. "*Continue with the briefing. I want to know everything. What are these data you're showing us?*" She traced the swarm of symbols she recognized as carbon-based chemicals

"*These are data from biological material collected from two probes that came from Earth,*" Inirhi said.

"*I'm sorry, Inirhi. I don't follow,*" Saavi said.

"*Two probes came through the wormhole,*" Inirhi said.

Saavi's jaw dropped.

"*They arrived about a half arhim after the wormhole appeared,*" Inirhi said. "*Their point of origin is Consortium Homo*



*Astro Space Enterprises. Although their date stamps are weeks apart, they emerged from the wormhole together.”*

Saavi locked eyes with Rodhyn and their sirphin thrummed with confirmation: EpsIndi’s present had aligned with Earth’s present! *“Did you send a response?”* Saavi asked.

Inirhi’s sirphin dampened. *“That’s beyond Kaden’s clearance for temporary command,”* she said. *“My priority was managing the threat of biological contamination. System says Earth’s holobiome is very, very sick. I ordered System to isolate the drones in a service air lock. System had to dig deep into the archive to find the encryption code and download their data.”*

Jaidha’s face glowed. *“Inirhi, as a matter of fact, as biosavant, you do have the authority to respond. The biological threat justifies responding to the query.”*

*“I didn’t think of that,”* Inirhi took a deep breath. *“System concurs,”* she said.

*“But, can’t we send a probe to look for Ahlan’s fleet?”* Saavi pressed.

*“That is beyond the authority of a biosavant,”* Inirhi said. *“Callya has more data to show you. I’m due on the Bridge now.”*

Callya projected new graphics in the immersion space and Saavi traced the symbols with her fingers. *“Callya,”* she said, *“who processed these data?”*

*“These are data system gathered and analyzed from the wormhole,”* Callya said.

*“They’re data on structure and acceleration,”* Rodhyn said, and his link was tremulous with awe. *“Saavi, your solution was correct—at least for our wormhole terminus.”* He turned to face her. His farsick eyes underscored his link speech. *“The probe from Earth implies a similar configuration at the opposite terminus. But we still don’t know what makes the wormhole traversable.”*

*“Flagship says the people of Earth need to see you, Saavi,”* Callya said. *“They’ve been waiting too long to learn the colonists arrived safely. You must tell them what happened.”*

*“I don’t have words for such a message,”* Saavi said.

*“I will help you,”* Callya said.

*“Can you give me the words to ask about technical aspects of the wormhole?”*

The words Callya suggested were simple, but as Saavi spoke them to record the message, her voice trembled with the same farsickness that Rodhyn held in his eyes. She finished the message just as Inirhi’s link pinged from the main Bridge.

*“Chaos on the Bridge!”* Inirhi said. *“Najaam Dunia Command has seen the wormhole and is demanding answers. We can expect Vice Admiral Declan’s imminent return. If we’re going to respond to Earth’s probes, we need to launch ours before Declan resumes command.”* After an electric pause, she said, *“By the Maker Moon, System just tracked a ship approaching from the Hub. Unscheduled. Defying restrictions. There’s only one person I know who has the clout and the nerve.”*

*“Gameya!”* Saavi said.

*“Kaden will have to allow her on Base, out of deference to Vice Admiral Declan,”* Inirhi said. Her link crackled with emotion. *“Another drone just emerged from the wormhole! And Vice Admiral Declan’s ship is hailing. How soon can we launch our probes?”*

*“System requests confirmation for course trajectories,”* Callya said.

Saavi checked System’s calculations for multiple trajectories and realized Inirhi was launching two probes. Her heart raced when she confirmed the trajectories: the second probe was programmed for a broad sweep near Asteroid Belt of Earth’s solar system.

*“System says the biosavant authority extends to a search for the Dactyl,”* Callya explained.

*“I concur with course trajectories.”* Rodhyn said.

*“Probes away,”* Inirhi announced. *“Vice Admiral Declan is on the Bridge. I’m damping my link.”*

# Chapter 46

*“We’re taking a stab at matter/Taking a stab at matter/  
Taking a stab at matter/Set the spirit free—“Taking a Stab at  
Matter,” by Bruce Cockburn, from Bone on Bone*

## Earth Present 7

Piercing chirps from overlapping system alerts woke Bailey from his sleep cycle. The unauthorized launch of a CHASE warp drive probe set off the first alarm, and an anomaly from Kapila’s biomonitor triggered a second. Bailey dispatched a medical technician to check on Kapila. He pinged Casandra while he traced the probe launch and discovered it originated from Kapila’s console. Casandra responded to his ping, but a third alarm overrode his acknowledgement.

“Wormhole breach!” he announced. As soon as he said it, his sensors lit up with not one, but two, incoming probes.

“Casandra, I need you in the Con,” he said.

“On my way,” Casandra said.

Kapila’s biomonitor screeched again, adding to the melee.

“Casandra, the med techs are rushing Kapila to Sick Bay,” Bailey said. “He’s in cardiac arrest.”

Casandra’s biosigns registered shock and confusion.

“Go to Sick Bay,” Bailey said. “With your permission, I will rouse Winona to come to the Con. Do you want me to wake EvaLynn to accompany you to Sick Bay?”

“No, I can do this,” Casandra said. “Wake Winona. I’ll meet you in the Con when I can.”

Bailey received Casandra’s anthropomorphism as an affirmation and wished he had an actual body that could meet her in the Con.

He roused Winona. As she took her seat, he projected the image of the object that breached the wormhole

Winona stopped chewing her ponytail and gaped. “It looks like a dolphin swimming in a sea of stars,” she murmured.

“On further analysis, I’ve learned that it breached the wormhole 49 hours ago, but just now triggered my alarm.”

“So, that thing—whatever it is—has been sitting out there for two days?”

“If I can trust my analysis,” Bailey said. “But my sensors didn’t register the data until now. The most likely explanation is the Messenger’s interference. The data themselves are baffling—there are at least five human-range biosigns. And the object has its own biological signature.”

“It’s alive?”

“I deduce that it’s a ship. I’m hoping the data from the from the incoming drones will answer some questions.”

Winona pressed her palms to her temples and took a deep breath. “Incoming drones? Isn’t this what we’ve been waiting for?” Her words hung in the air as Casandra entered the Con. Winona jumped up and embraced her.

“Kapila is gone,” Casandra said with a shuddering sigh. “No sign of struggle, no trauma...he’s just dead.” She pulled away and looked into Winona’s eyes. “I want this news contained until we have a conclusive cause of death.”

Death.

Bailey searched his memory, confirming this was his first experience with the death of someone he knew. His phantom vagus nerve felt inflamed and raw. His phantom throat tightened and he tasted salt. His emotional processors ricocheted between sadness and anger. Perhaps it was a malfunction, which might explain his inability to correlate the data from the incoming probe with anything in his data bases.

“What’s this about incoming drones, Bailey?” Casandra asked. “You lost me back there at ‘wormhole breach’ and ‘cardiac arrest.’”

“Still processing,” Bailey said, searching for the encryption key as a niggling dis-ease further confused his emotional programs. Time seemed to dilate and his sense of physical orientation fell into the timeless space between the q-bits of his organic matrix’s microtubules.

“Data. Denied,” Bailey said.

“Bailey, your voice...” Winona said. “It sounds—”

“Stand. By. Diagnostics.” Bailey said.

“I’m calling IT,” Winona said.

“Alarms!” The cry came from the doorway. Ella clutched the doorframe, barefoot and in pajamas. “*Que mala. Ayudame, Mama,*” she said.

At least Bailey’s language processors worked. He recalibrated as Casandra rushed to Ella’s side, and time began to reflow.

“I am unable to decrypt the probe data,” he said, and Ella covered her ears.

Winona’s fingers flicked over her console. “Checking... Casandra, I need your override to access the encryption files...”

Casandra looked up and stood still for the retinal scan.

“Bailey,” Winona said after a tense moment. “I can’t find the encryption files.”

Ella took her hands from her ears and tilted her head. “I have an idea,” she said. “Winona, take Bailey to my room. I will stay here with *Mama.*”

“What’s in your room?” Casandra asked.

“Bailey will know,” Ella said.

Bailey directed his sensors to Ella’s quarters and waited for Winona. The room lights brightened with her presence and her quick intake of breath drew his attention to the walls. Every centimeter bore at least one meticulously applied, perfectly round

dot of paint. Some dots were raised, some were grouped to form human figures—hairless and swirling with patterns—and others created geometric shapes and swaths of gradient color.

“Scanning...” Bailey said.

“*What’s going on Bailey?*” Winona linked.

“*I have it,*” Bailey said. “*The decryption key. Ella embedded the decryption key in her paintings.*)

“*She didn’t have access...*” Winona’s eyes lost focus for a moment. “*Never mind,*” she said. “*I believe you, Bailey.*”

“*Go back to the Con. To the immersion well,*” Bailey said as he used the key to decrypt the probe’s data. His emotional processors set up a new clamor, bringing to mind an admonition he’d heard EvaLynn give staff many times: don’t buy a ticket for the roller coaster. “I’ve retrieved the data,” he said as soon as Winona returned to the Con. “It is a message with visuals and audio.”

“From the colonists?” Casandra breathed.

“I can neither confirm nor deny,” Bailey said. “I can confirm that one drone is a search probe and the other is a message drone. If you’re ready to receive the message, please enter the immersion space.”

Winona and Casandra clasped hands and stepped into the immersion well.

“The speaker’s language is a dialect of English,” Bailey said. “A dialect not in my data base, but not a problem for my language processors. I will overdub with standard English.”

“Explain,” Winona said.

“I cannot explain,” Bailey said as a holo of a bald female with a naked torso coalesced in the immersion space. Her skin swam with turquoise and magenta patterns.

Ella clapped her hands.

“Ella, it’s...” Casandra whispered.

“My paintings!” Ella cried.

“Please listen,” Bailey said. “Listen to the cadence of the speaker’s voice as I translate.” He paused. The woman in the hologram raised her palms and began to speak. Bailey layered his voice over hers. ““Travelers arrived safely,”” he said. ““We are the offspring who waited ten times ten times five earth orbits for timelines to match.””

A moment of silence sat on Bailey’s phantom chest.

The speaker continued, and Bailey overdubbed: “We lost... ships...we need wormhole...math...making...(I’m paraphrasing...) wormhole design specifications.” He searched his data bases in the stunned seconds that followed.

“Play it again,” Winona breathed.

Bailey repeated the program.

“Bailey, what does it mean?” Winona cried. “Offspring waited...” She counted on her fingers. “500 years?”

Cassandra tilted her head. “Did she say...lost ships?”

“Perhaps that explains this,” Bailey said. He retrieved the image of the ship, sensing the subtle changes in Cassandra’s brainwaves as she studied it. “Have you hailed it?” she asked. “Is it heading toward Earth? How close is the nearest Shang Jin ship?”

“I have not hailed it,” Bailey said. “For that, I need an encryption code and authorization from two officers. To answer your other questions: the ship is stationary, adrift. And a Shang Jin freighter is on a trajectory to encounter it in four point two five hours—”

A melancholy siren wailed through Bailey’s link. “The drone sent a retrograde signal and then shut down,” he said.

“Could you try hailing the EpsIndi ship with the same encryption as the message drone?” Winona said.

“It isn’t likely to have the highly classified key, but I will try,” Bailey said. “In the meantime, I recommend applying our cloaking technology to the ship, before the Shang Jin ship detects it.”

“Make it so,” Cassandra said.

“It is done,” Bailey said. “And none too soon. I’m picking up chatter between the Shang Jin ship and its base on Mars, concerning an energy signature, but not for the cloaked ship. For the Rabbit Hole.”

“Shit, Bailey, it’s your dream!” Winona said.

“How long before Mars Base analyzes that signature?” Casandra asked.

“Unknown,” Bailey said. “Perhaps only a few hours.”

Winona stood up and stared across the room, turning pale. “I have a visitor,” she whispered, pointing.

“I detect the digital pattern...of the Messenger,” Bailey said.

Winona took a step forward. “Bailey, the Messenger says you need his help,” she said. “To expedite your next message to Thomas.”

“Holy, shit, Winona,” Casandra said. “Am I losing you, too? And Bailey, have you been contacting Thomas without my authorization?”

“I used established tactics to get Thomas’s attention,” Bailey said. “The matter at hand is critical. I’ve launched a plan to back up and reset my systems so we can perform the Deep System Analysis and recover my damaged files.”

Casandra spoke in a tense whisper. “If I didn’t need you so desperately right now, I’d have IT disconnect your organic matrix.”

“Casandra, I understand your concern,” Winona said. “But I believe we should trust the Messenger.”

“That’s what worries me,” Casandra said. “There’s protocol for involving an unvetted third party,” Casandra said.

“But Thomas?” Winona said. “We already have an agreement on record!”

“Never mind that Thomas has every right to nullify that agreement,” Casandra said. “I’m talking about the Messenger. This is unprecedented.”

“We don’t have time to vet—” Winona said.



“Then I’ll settle for a briefing with EvaLynn and an IT rep. But first, hail that ship.”

“The lag time is 26 minutes in each direction,” Bailey said. “And EvaLynn is not available.”

## EpsIndi Present 7

*“You are not a drop in the ocean. You are the ocean in a drop.”* Rumi

Saavi rocked in her berth as she nursed Bodhi, aching for Ahlan, for home, for something normal. Her little nook was many decks and airlocks away from Vice Admiral Declan, yet his presence repelled her sirphin.

Declan’s first act upon resuming command was to announce that he was now Admiral of the Fleet. Without the full crew complement on Base, the proclamation rang hollow, until he made a show of throwing Inirhi and Kaden in the Brig.

Flagship transmitted an empathetic bellow directly to Saavi’s link. *“Under the circumstances, I deemed it best to dampen Inirhi’s and Kaden’s personal links,”* Flagship said. *“To compensate, System and I augmented your access to System communications. You can now access me and System without Callya as intermediary. By the way, Declan is interrogating Kaden and Inirhi now.”*

*“I can’t bear it,”* Saavi said. She placed Bodhi in his cradle and flopped on the bunk. I should Sit with Jaidha to comfort her, she thought, but she couldn’t fight the tide of exhaustion that pulled her into sleep.

Callya’s lights were dim when Saavi emerged from her berth and found Jaidha pacing the corridor.

Jaidha’s sirphin brightened but retained their stress pattern when Saavi approached. *“I misjudged Admiral Declan,”* Jaidha said. *“Such disdain for Inirhi’s biosavant authority. After all she*

*has done for him—*” She clapped her hand to her mouth as if she’d spoken aloud.

*“Kaden handled the interrogation well,”* Callya said.

*“Inirhi, perhaps better. Biosavants have an advantage, regardless of Admiral Declan’s low regard. Inirhi stood her ground. And she made sure she’s on record for intervening on behalf of the Dactyl’s missing fleet.”*

Saavi sensed the peripheral buzz of Rodhyn’s sirphin, and turned.

*“I deplore Declan’s tactics,”* Rodhyn said. *“His wife’s influence has warped him.”*

*“Speaking of Fist Mother Gameya,”* Flagship said, *“her ship is within docking range, in defiance of Declan’s order to return to the Hub. Would you like a link to the audio?”*

*“Please,”* Jaidha said.

Declan’s voice was first. *“The Base is not safe for civilians,”* he said.

*“And whose fault is that?”* Gameya responded. *“I will not turn back. I’m exercising my civilian right to challenge the militarization of the wormhole.”*

*“That’s a serious accusation,”* Declan said. *“But it implicates you. It implies you knew about the wormhole’s appearance.”*

*“You deflect blame but don’t deny my accusation?”*

Gameya said. *“No matter. You’ll come to your senses, in light of our mutual need for Saavi and Rodhyn Rohsen. But it’s very odd. They disappeared three days ago. Just after Saavi gave birth. And no one has seen her aunt or her cousin.”*

*“Are you insinuating that they’re on Base?”* Declan asked. *“The only record of an unscheduled ship departing the Hub is yours.”*

*“You underestimate their obsession with the wormhole,”*

Gameya said. *“I suggest you search the Base and the Fleet.”*

Callya lowered her lights to a soft, blue glow. *“If I’m discovered so will you be.”*

*“Send the humans to my stasis deck immediately,”* Flagship said. *“I will conceal them in the false bottoms of the stasis pods.”*

*“What about Callya?”* Jaidha asked.

*“The niri will disguise her,”* Flagship said.

Trembling, Saavi scooped up Bodhi and joined her family for the long descent to the lowest deck, near Flagship’s stern, and climbed into a pod the size of a sleeping bunk.

*“You may experience claustrophobia,”* Flagship said, *“but you’ll have plenty of air and some filtered light.”*

Niri membranes nestled Saavi’s body and adjusted to her temperature, pulsing with smooth contractions and thrumming a pleasant harmonic. She tucked Bodhi in his sling and held him close. *“You must think you’re back in the womb,”* she said.

Her sirphin boosted her calming hormones and she drowsed until she heard Flagship’s resonant link as the sound of voices and footsteps seeped into the pod.

*“Stay still,”* Flagship said. *“The search team is in the stasis chamber.”*

*“I hope I never have to use one of these things,”* someone said. *“I guess we should open it. But I don’t see a latch.”*

The pod shuddered. Bodhi gave a startled cry and Flagship covered with a series of melancholy notes.

*“Ships are creepy,”* the same voice said. *“Sounds just like a baby.”*

*“Ships make noises when they’re upset,”* said another. *“You don’t need to be so rough.”*

After several seconds of silence, Flagship sang another eerie tone. *“The search is over,”* she said. *“Callya remains undetected. However, Admiral Declan has granted Gameya permission to board. She will demand another search. With your permission, I will induce a charta for you all, especially for Bodhi. All of your biological needs will be met. You will dream. In fact, I*

*will use your dreams to keep you informed about Declan and Gameya's activities."*

Saavi was unsettled by the first dream's patina of serenity: Declan and Gameya in the Admiral's quarters, sipping drinks near a viewport where a constellation formed a crown behind Declan's head.

Gameya's sleeveless robe merged with the background of rich fabrics draping the walls. She spoke in a steady voice. She was like Ahlan in that way: outwardly even-tempered, even when roiling inside. "I had hoped you would work with me," she said. "To understand the wormhole, we need Saavi and Rodhyn."

"Is understanding what you seek?" Declan asked. "I've never understood the kind of power you crave."

"Because there's no tangible reward?"

"Because it's narcissism," Declan said.

"And you're a hedonist," Gameya said. "But enough name calling. The wormhole is an invitation for intruders and our world needs protection, but you, my husband, have set our default position to escalation and aggression."

"Nonsense," Declan said. "I believe an ancient Earth general once said if one wants peace one must prepare for war. I merely serve the Commonwealths and their modest hopes that the wormhole will benefit both EpsIndi and Najaam Dunia."

"You never had a modest hope in your life," Gameya said. "It's profit you're after. And for that, you need the professors' expertise."

"If you'd been patient, I could have brought the Rohsenim here without incident. But Koshim started riots and perhaps forced them into hiding."

"You're blaming me for the riots?"

"You knew about the wormhole before I did."

"Thanks to Kaden DeSousa's foolishness."

"That's why he's in the brig," Declan said.

“But why Inirhi? Your fleet is useless without its biosavant.”

“Inirhi launched drones into the wormhole without my authorization,” Declan said.

“And your ego is so fragile, you incarcerated her without due process,” Gameya said. “Now, your most senior officers are quite indisposed and you’re not remotely prepared for any incoming threat. You won’t have a full complement of officers and crew until they return from the funeral.”

“Who could have foreseen the Admiral’s death or changed the timing?” Declan said. “Besides, you’re more of a threat than anything that could come from the wormhole.”

Saavi wanted to scream at them. Declan made no mention of Ahlan or the Dactyl fleet. Gameya had no idea of the stakes that drove Inirhi’s decision to launch the drones.

“Let me interrogate Inirhi,” Gameya said. “I can make her tell us how to find the scientists.”

“Only if I accompany you,” Declan said.

Saavi’s dream streamed a melody that softened the sinister cadence of footsteps, the swish of cloaks, and the crackle of the force field dampening to admit Gameya and Declan to the Brig.

Declan passed an empty cell. Its force field threw a sparking arc. It snared him and yanked him inside. He kicked and sputtered while Gameya’s sirphin glowed placidly blue.

“I wonder why your security detail isn’t coming to your rescue?” she said. “Could Koshim sympathizers be embedded within the Fleet? Could you have been too busy planning your wormhole heist to notice?”

Gameya swept into Inirhi’s cell. “Believe me, young woman, you’re more valuable on the Bridge than you are in this hole,” she said. “But I simply can’t release you unless you tell us where to find the Rohsenim. I understand you have a pet ship. Isn’t her name Callya? I’m sure it would pain you to part with her.”

Saavi recoiled. *“Flagship,”* she cried. *“I can’t bear this dream.”*

Her sirphin thrummed and sang, and she something carried her to a vineyard and placed her on a path in golden sunlight with two women. *“What kind of dream is this?”* she asked. *“I can see myself.”*

*“You have visitors,”* Flagship said. *“This is the only way I can present them to you.”*

Saavi looked again. One of women reminded her of her mother, and the other resembled a portrait of her many times great-grandmother Chava Rosenberg. A pillar of light moved beside them, along with a gangly young man with a thick auburn hair and an unruly beard.

*“Don’t fret,”* her mother said. *“The energy that healed me will hold Ahlan. Yes, I’m healed now. And, yes, we know where Ahlan is.”*

*“But no one seems to care where Ahlan is!”* Saavi said. *“He’s not even a pawn in the game.”*

*“Ahlan is where he needs to be,”* the pillar of light said.

*“Are you my malak?”* Saavi asked. *“I’ve never seen my malak’s form.”*

The pillar of light brightened.

*“It’s your form that matters now,”* the young man said. *“I’m Isaac Rosenberg. I came to see you. So I can paint again.”*

*“Each of the Messengers has given exotic matter to keep the wormhole open,”* the pillar said. *“But we’re weary and at risk of failing. The energy you gave us when you birthed the wormhole can’t sustain us.”*

*“Dear, dear Saavi,”* Chava said, *“your energy is not infinite. You must act soon. Tell your uncle to look back at the SkyFall Day interview that causes him such embarrassment. It holds a gift for him. And look inside yourself. You know who you are. Study those who oppose you. Their motives are ancient;*

*nuanced. Beware. Examine the drone that arrived just before Declan's ship docked. Your counterpart is looking for a host."*

The pillar of light sprouted red lips and flashed gold earrings. It spoke with a female voice. *"This is your tikkun olam,"* it said. *"It is for the whole universe."*

## Chapter 47

*“We have to confront the problem of how to construct a rational and complete understanding of the world that allows the observer to be in the world. But observers are not simple things and any universe that gives rise to, and is hospitable to an observer must be complex. Thus, a theory of a whole universe...consistent with what we know of quantum theory and relativity, must be a theory of a complex and self-organizing universe.”* *The Life of the Cosmos*, by Lee Smolin

### Earth Present 8

As Bailey revealed his back-up plan to Casandra, he sensed her pulse slowing, her respirations deepening, and her brain waves changing to a state that had saved the world more than once.

“It’s not even the strangest thing I’ve encountered today,” Casandra said, with her head leaned against the wall and her fingers tented on her lap. “Without the Nair Institute, we are completely out of our depth, and I can’t think of a better option. I’m leery of involving Ella, but I won’t rule it out. What’s Commander Worth’s status?”

“Out of Sick Bay, resting in his quarters, but still reporting general malaise, weakness, loss of appetite and low grade fever,” Bailey said. “He insists he’s well enough for briefings with you and collaboration in command decisions.” Bailey knew Casandra would interpret the latter expectation loosely.

In Bailey’s assessment, Casandra was better suited to command than Denzel. If ever there was a good time for the Base to face multiple crises, it was while Casandra was in charge.

“When can we expect a response from that ship?” Casandra asked.



“The ship should have received my message by now,” Bailey said. “We must allow time for decryption and composing a response.”

An hour passed. Bailey sensed the humans’ growing restlessness.

“Still no response,” Bailey said. “The biosigns haven’t budged. Even if they can’t decrypt the message, their biosigns should have registered a reaction. Perhaps they’re in stasis, conserving life support systems.”

“Prepare a briefing from the top for Commander Worth and then get him on the link,” Casandra said. She took a seat next to Winona. “But don’t tell him any of that crap about the messenger.”

Denzel answered with audio. “I told Bailey to hold visual on my end,” he said. “I look like hell.”

“There’s something on our end you must see,” Casandra said.

“Just tell me,” Denzel said. “Give it to me straight. It’s not like I haven’t spent the last eight months preparing for the worst.”

“You didn’t prepare for this,” Casandra said. “Cue the message, Bailey.”

After Denzel viewed the message, it took exactly 10 seconds for him to breathe. It was a long, rattling breath. “I already buried Chava and Katsuo and Althea and Kapi and Jacob and Owen,” he said. “Now....this...I don’t know...am I supposed to resurrect them and grieve all over again? And now you’re telling me Shang Jin is on to us? What a pile of shit Kapila and the Nair Institute left us.”

“We were always prepared to deal with the consequences of our PanSystem Treaty violation,” Casandra said. “But with Bailey compromised...”

“Where’s our legal counsel?” Denzel said. “We can demand our right to an investigation before they indict us. It will buy us a little time while Bailey resets.”

“Keep in mind, the EpsIndis are waiting for our response and we don’t know how to help that ship,” Winona said.

“Bailey, how much time do you need to reset?” Casandra said.

“The whole plan takes at least 72 hours,” Bailey said. “But I don’t need to shut down until the final 24. I’ve created a proxy program to run while I’m deactivated. IT will be none the wiser.”

Denzel took another breath and coughed. “We can’t keep the EpsIndis waiting,” he said. “There are lives on that ship.”

“We can’t be sure the EpsIndis will respond before I shut down,” Bailey said. “If their response were to come after I deactivate, the proxy subprogram would need to divert the response from IT’s detection. I can’t guarantee it.”

“I agree with the Commander that we can’t leave the EpsIndis hanging while we wait for Bailey to reset,” Winona said. “Could we at least acknowledge their message? I’ve composed a response in my head already!”

“Let’s hear it,” Casandra said.

“We inform them we’ve detected an object we assume is their ship, hailed it with no response and cloaked it for security, and make it clear we need them to wait 72 standard Earth hours before sending their response and instructions,” Winona said. “If that’s within the scope of Bailey’s language processors.”

“It is,” Bailey said. “But there’s a point you failed to address. The EpsIndis also requested wormhole specifications.”

“That’s too much to give away in our initial response,” Denzel said.

“I concur,” Bailey said. “But there’s something you should know. Even if I thought it was wise to send the wormhole specifications and risk having them fall into the wrong hands, I would be unable to complete such a task. Kapila destroyed his files before his death. Unless the Deep System Analysis finds them, I no longer have access to them.”

Bailey's last words launched a paroxysm of coughing from Denzel. "Our only hope is to restore you, Bailey," he said. "Work with Winona to send a response to EpsIndi. And then get to work on your insane back up plans."

Collum stood in the driving sleet with Sisar and EvaLynn, just outside the security gate, waiting for Rachel to notice them, hoping the cider and cocoa ploy would work again, and wondering what he was getting himself into.

EvaLynn fidgeted with her poncho. "Help me push the carts to the gate," she said. "Let's get this over with."

Sisar scrambled to help, and Collum steered.

A few protesters waved to get Rachel's attention, and called, "Hot drinks!"

Rachel shielded her eyes with her hand and then trotted toward the gate. "I have to acknowledge you or these people will think I'm an asshole," she said, locking eyes with EvaLynn. "I will not talk to *him*," she said, with a nod toward Collum.

"We need to see Thomas Manitowabi," EvaLynn said.

"You know the drill," Rachel said. "It has to be arranged."

"It's urgent," EvaLynn said.

Rachel looked toward the throng of protesters. "He's expecting me back at the lodge in a couple of hours," she said. "I could bring you along, but I can't promise he'll receive you."

"Help us distribute these drinks," EvaLynn said.

"Hopefully, we can slip out among your people without drawing attention to ourselves."

"Even so, it's a long walk there and back if he's not in the mood," Rachel said.

By the time they'd woven their way through the protesters, the icy rain was pouring off their ponchos. Rachel trudged in front, head down.

Collum's thoughts careened with memories of his life with her. How could she be here with him now? The fantastic

improbability made his heart pound, rekindling his anxiety about the unknown threat that emboldened Bailey to send them on this quest.

He took a few deep breaths, filling his lungs with pine-scented air and calming his mind. He traced the silver ribbon of road winding through thick stands of red pine, poplar, and juniper coddled by sage and golden currant bushes pulsing with reds and greens in the rain-pearled light. Behind him, EvaLynn and Sisar breathed heavily. “Rachel, can we take a break?” Collum said. “I need to listen to Bailey’s instructions.”

Rachel halted and shrugged her assent.

Collum stepped off the road and tapped his temple to launch Bailey’s file menu.

Bailey’s recorded voice told Collum to sing the chorus of *Ganja Farmer* to unlock the files. Collum cleared his throat and ducked deeper into his hood. “Ganja farmer, ganja farmer, I just wanna be a Ganja farmer,” he sang, sheepishly.

Rachel rolled her eyes and Collum quashed the urge to defend himself.

Bailey’s instructions were as simple as they were absurd. Collum laughed to keep from crying. “Thomas Manitowabi is going to think I’m really Kokopelli!” he said. “Thanks, Rachel, We can go on.”

They walked for half an hour more, and then Rachel left the path and led them through a grove of pine. Low branches grazed their shoulders, shedding moisture. A camper came into view and Collum recognized the site from his earlier trip with EvaLynn.

Thomas met them at the door without his security team.

Rachel tilted her head toward Collum. “I’m sorry, I couldn’t warn you,” she said.

“I’m expecting them,” Thomas said. “The *miigi*...told us something’s afoot. But all this mystery.” He studied Sisar’s face, and his countenance settled as if he saw something reassuring.

“Maybe it’s best we don’t know the truth.” He stepped aside to give them room to enter the narrow door.

Collum eyes adjusted to the dim interior. He smelled fresh coffee and heard the clink of mugs. In the shadows, Magdalena turned her face toward Collum. Her eyes were wide, her face relaxed. She began pouring coffee and handed the first mug to Collum. It tasted like courage.

“These *miigi*,” Collum said, “what are they?”

“You’ve met one of them,” Magdalena said.

Collum shook his head. “I still don’t know what the hell I saw. Or whose side it’s on.”

“Are there sides to be taken?” Thomas said. “You still haven’t told me why you’re here.”

“Just following Base AI System’s instructions.” Collum stole a glance at Rachel and caught her gazing back. She blushed and looked down.

“As much as I appreciate Rachel’s help,” EvaLynn said, “I’m not sure she’s privy to this conversation.”

“That’s fair,” Thomas said. “Rachel, you may go ahead to the lodge. Get warm. Eat. I’ll meet with you later.”

Rachel’s facial muscles relaxed. She slipped out the door without a word.

“Your Base AI is giving orders now?” Thomas said. “You see why I don’t trust these things.”

“I do trust Bailey,” Collum said. “But I must admit, what he told me...it’s a stretch, even for me.”

EvaLynn threw up her hands. “Tell us already!”

“All right, all right.” Collum took a deep breath. “Bailey said we need to take psilocybin. A high dose.”

Thomas cocked his head to one side. “What kind of bullshit is this?”

EvaLynn waved her hand in front of Thomas’ face. “Give him a chance, Thomas. Would your Fox Old Woman come here to bullshit you?”

Sisar said, “Ahhh..A series of high doses could stimulate new dendrites. Bailey told me we would be helping his system back-up.”

Collum raised his brows.

“Bailey’s higher functions are processed in an organic matrix,” Sisar said. “Like our brains. Perhaps he wants to increase our brains’ storage capacity.”

“That’s not plausible,” Collum said. “We can’t possibly grow enough dendrites to store his systems,” Collum said.

Thomas grimaced. “Psilocybin? Even if this is true, what makes you think I have access to psilocybin?” He muttered something about racist crap.

“I’m sorry, Thomas,” EvaLynn said.

Magdalena put her hand on Thomas’s shoulder. “This is a true thing,” she said. “We are the closest help. The young people will know. In the meantime, we need to find lodging for our guests.”

Thomas’s mouth opened, but Magdalena shot him a look and his jaw snapped shut. “We will all go to the lodge,” he said.

The long, curved-roofed building came into view behind another thick stand of trees. It seemed to be made of woven saplings. Inside, its walls were plastered and smooth. Collum felt a wave of relief as he entered the organic environment. It made him wonder what was up with the tacky camper. Maybe Thomas didn’t want people to encroach on the lodge, which felt sort of sacred.

Magdalena assigned Collum and Sisar a small sleeping alcove in the loft. Collum didn’t see where she placed EvaLynn, and Rachel was no where to be found.

Dinner was stew and warm flatbread. Thomas introduced two young men who brought the psilocybin.

“For what you want to accomplish, you’ll need to take a...masters dose,” said man named David Crane. “People usually start out with small doses and gain experience before they go to the

level you'll need to change your brain structure. You'll need experienced guides to stay with you."

Collum spent several hours in meditation before he went to bed. At breakfast the next morning, he didn't feel like small talk.

"You're sure quiet," EvaLynn said. "Scared?"

"Is this a test?"

"If it is, I'm not the one checking the answers," EvaLynn said.

"I'm excited," Collum said. "I've done peyote before, in low doses. I liked it."

"You don't look excited," EvaLynn said.

"Well, I'm sorry, but I don't have the right words for this. I'm eager. Sort of hunkered down. Willing to submit."

"That is good," Sisar said. "This is not a trivial thing."

Collum looked down and stirred his oatmeal. "It's more than that. It's spiritual."

"Are you expecting to meet God?" Sisar asked.

"I've already met what you call God," Collum said. "It's not some inaccessible plane."

"I don't believe in a deity," EvaLynn said.

"None of us does," Collum said. "We aren't capable of believing hard enough to grasp what that even means."

"Well, I'm terrified, and I'm not ashamed to admit it," EvaLynn said. "But it's not the psilocybin that scares me. I'm afraid my brain...my psyche...can't handle Bailey's data."

"Like Ella," Sisar said. "My daughter's wisdom can't always be explained."

In the early afternoon, Collum, EvaLynn and Sisar gathered in the loft with David Crane.

Magdalena had provided them with loose clothing. "No binding or chafing to distract you," she said.

David Crane gave them strong tea that tasted like capers and dirt and soy sauce.

"I will stay," David said.

The sun filtered through an opening in the roof, and a draft of crisp air refreshed the room. Collum reclined on a pillow and studied dust motes floating on a ray of sunlight twirling like tiny galaxies. His body began to feel heavy, his muscles limp. His cheeks lifted in an involuntary grin. From the corner of his eye, he saw Rachel and wondered why she was there. Her head was bowed, and she sat cross-legged. She reached out to take EvaLynn's hand. Collum felt the aching pleasure of an erection. Oh well, nothing he could do about that. Thanks, Rachel.

The ray of sunlight began to undulate and the dust motes burst into mandalas; fractals of colors that had no name. The roof melted away and the sun charged into the room, like a *merkabah*, as Chava had once told him was the name for Ezekiel's wheel. Collum fell inside the pillow, unable to distinguish any dimension, yet experiencing all of them as the pillow laughed at his predicament.

The drug saturated every cell until his body dissolved into a river of light flowing through and around him.

This is the Christ in all. I've always known it. Now I *am* it.

It all made so much sense, as if he'd always carried it deep within his cells. *Merkabahs*, chariots to the heavens, which are not somewhere above, but within the space between the elements, holding the essence of all persons and things, otherwise impenetrable and invisible. Even his demons were there. We all have them, he told himself. Sit with them, and they will give up their power. We're just part of all that is, they told him.

He swam in a sphere that called itself a quantum of eternity. He looked for Chava. He wept for her and felt the buttery softness of his infant son's skin. He smelled Rachel's fresh, nectar-sweet scent and touched her textured hair.

With deep longing, his spirit found its way back to its flesh.

This is what spirit wants, he said. Flesh. This beautiful, ethereal realm wants flesh.

Why do you think I came? the baby Jesus said.



## EpsIndi Present 8

Saavi almost forgot she was dreaming in the false bottom of a stasis pod. The console on Callya's Bridge felt solid under her hands. The air smelled of kelp and citrus. The wormhole dominated the viewport. Inirhi and Jaidha were there, even more beautiful than Saavi remembered them.

Jaidha's best feature was her luscious mouth. Her sirphin formed tiny wings and sunburst patterns, in emerald and rose, limned by silver. She was tall, with small, high breasts and a long torso. A cropped vest and a biosavant's utility belt comprised her only covering.

Inirhi's breasts and hips were fuller than Jaidha's, and her muscles were sculpted, from work with the ships, Saavi guessed.

The women's sirphin were in sync, their eyes tender toward each other. For the first time, Saavi realized they were in love.

The revelation emboldened her. *"There's no reason to stay in hiding and risk the ships,"* she linked. *"Why don't turn ourselves over to Gameya and Declan? What can they do to us? They need us."*

*"They can't hurt my ships,"* Inirhi said. *"But it serves my purpose to let them think they can. For months, I've accommodated their plans within plans within plans, while everyone pretended they didn't think the wormhole would ever appear, yet everyone plotted for a stake in it. But they didn't anticipate losing the Dactyl fleet."*

Saavi fell upward, and saw herself untethered without Ahlan. The longing will take me, she thought. My mind can hold the whole universe in mathematical formulas, but without him, I'm lost, lost, and lost in these plans within plans within plans. She linked to Inirhi. *"Shouldn't we have a response by now from the drones?"*

"Ah, about that," Inirhi said.

A haunting minor tone pulsed in Saavi's ears.

*"That sound is the search probe's abort code," Inirhi said. "Armed ships on the Earth side of the wormhole were in range to detect it, so it disengaged."*

Saavi saw herself, in the manner of dreams, standing speechless, bereft and afraid.

*"We shouldn't be wasting our time with probes," Inirhi said. "Flagship is our best hope. She's the MegaFleet mother and they would not obey anyone's order to challenge her. We could rescue the Dactyl and her fleet. And she's equipped to deal with any external threat."*

Rodhyn appeared beside Saavi, as if he'd been standing there from the beginning. *"I fail to understand what that would accomplish, Inirhi,"* he said. *"And you know better, Saavi. We're not prepared to send a ship through the wormhole."*

*"But Ahlan's ship and his fleet—"*

*"Even if they chanced to be in the precise position to be sent to the opposite terminus when the wormhole appeared, we don't know how to recreate those conditions,"* Rodhyn said. *"We certainly don't know what's keeping the wormhole open or how stable it is. Only our analysis of the exotic matter can do that. Besides, your spirit guides told you Ahlan is where he needs to be."*

*"Were you there when my spirit guide told me?"* Saavi said. *"Then you must also know the wormhole is stable for now."*

*"I need more than this dream to trust that as a fact,"* Rodhyn said.

*"You contradict yourself,"* Saavi said.

*"All truth falls into contradiction if you follow it far enough,"* Rodhyn said. *"You know that from physics."*

*"What harm would it do to review the Stream as my mother suggested?"*

*"I'm too feeble and weary,"* Rodhyn said. *"I can't bear to relive that interview."*

*"Then I'll do it for you,"* Saavi said.

Rodhyn faded, and Callya initiated the Stream for Saavi to view.

Saavi recognized the setting and the moderator who interviewed Rodhyn along with a science journalist. At the point when Rodhyn told the moderator he suspected the wormhole specifications were highly classified and weren't included in any of the databases that came with the ancestors, the moderator began to glow with a pale, blue aura.

Saavi's equation for exotic matter flew into the space around her and merged with the Stream. A thin wafer punched with hexagonal holes appeared in the graphics. It began to spin, and its pulsing color changed from yellow to lavender. "What do you think consciousness is?" the wafer asked. "No matter. I am a quantum bit in one of your neurons. As you may have already learned, the wormhole is open and stable, but it will be so only until it carries out its purpose. Let those with ears hear."

Saavi's equations began to dance and propagate with new configurations. She traced them in the air and recoiled. "What is this? This solution isn't stable at all!"

"You know what you must do," the q-bit said.

Saavi's heart began to pound.

"You are right to be afraid," the q-bit said. "As you can see, the Refiner will use the worm hole to end this cycle. One of the space-times must cease to exist. None of us knows what will remain as reality."

"Who will choose?" Saavi asked.

"That is your mission," the q-bit said.

The dream flickered and placed Saavi on Flagship's main deck.

Flagship spoke with the voice of the Stream moderator. "Gameya is with Inirhi and asking System for information on Earth's weapons capability," Flagship said. "System says, according to the archives, Earth's weapons are limited to short-

range lasers that cause thermal and photochemical damage, and projectiles scaled within the constraints of Newton's Third Law."

Inirhi popped into the dream. "The megaships' weapons are defensive," she said. "The sirphin..."

Gameya appeared, floating like a game piece. "Of course they are defensive," she snapped. "But their electromagnetic pulse has sufficient power to disable certain targets, and if necessary, to inflict harm."

Inirhi flushed as her sirphin swarmed in anger.

"I'm not the who designed these weapons nor am I the one who lusts to use them," Gameya said. "I'm just the one brave enough to point out the fact that they exist. If you're worried about your ships, you can spare them by turning over Saavi and Rodhyn. I will withdraw my threat as soon as the wormhole is secured."

"You'll never find her," Inirhi said.

"Who? Saavi or your ship?" Gameya asked.

"I'm right here," Saavi said.

Gameya swiped her hand through Saavi's image. "You're just a hologram," she said.

"No, this is a dream," Saavi said. "You can't see beyond your own nose. How in the name of the Maker Moon did you take control of the Base?"

Gameya's blue aura brightened. "How did primitive people on Earth construct a wormhole? How did they develop AIs that integrated with living organisms? How did we receive the gift of the sirphin, to help the universe evolve? These are the questions you should be asking. Because if we squander our gift, we don't deserve to exist."

# Chapter 48

*"Alice laughed: 'There's no use trying,' she said; 'one can't believe impossible things.'*

*'I daresay you haven't had much practice,' said the Queen. 'When I was younger, I always did it for half an hour a day. Why, sometimes I've believed as many as six impossible things before breakfast.'*" From *Alice in Wonderland*, by Lewis Carroll

## Earth Present 9

The hour was late, or early depending on one's perspective, when from the loft, Collum saw Rachel standing in the great room below, near the fire, after everyone had left. He came downstairs and approached her slowly, afraid she'd bolt.

She took a step back when she saw him. The flames leapt and danced in her brown eyes as she looked everywhere but at him.

"Rachel, please stay," Collum said. "Just tell me why you're here."

"Thomas hasn't released me," she said.

"That's not what I mean, but never mind. Does Thomas hold that kind of power over you?" Collum asked and regretted it immediately. It was the little barbs like this one that had driven her away.

"That's none of your business," she said.

"I never thought I'd see you again," he said, and the words burst from him, thick with tenderness and grief.

"I can't even look at you," she said in a small, thin voice.

"But you were in the room with me when I took the 'shrooms.' He said it tentatively, hoping it wouldn't push her defenses.

“I thought... I’ve heard things about psilocybin. I thought...I thought you might see... him.”

Collum’s throat tightened. “I felt him. It was..tactile...but.”

“But what?”

“You were there, too.”

“I was in the room...”

“No, you were with me in that place between dimensions and materiality and time,” he gushed, and saw her pull back, her eyes large and wounded.

“What does that even mean?” she asked. “You called someone’s name. It sounded like Kahava. Who is Kahava?”

“Chava,” he said. “We were friends, with some emotional entanglement, I guess.”

“Were? Past tense?”

“It’s complicated,” Collum said.

The fire crackled, and a log settled. A real fire, with warmth generated by a generous entropy. It seeped into the ache in his heart.

“Did you really feel our baby?” Rachel asked.

Collum resisted the urge to reach for her. “I felt his skin, smelled his breath.”

“I’ll never get over it,” she said.

He wanted to hold her, but he stood with his hands at his sides. “We’re not supposed to get over it,” he said.

Her gaze flickered up at him, and then she stared at her feet. “Some days, I can hardly breathe.”

“I know,” he said, barely able to form the words.

“So, what are *you* doing here?” she asked. Her voice was soft, but its inflection held an edge.

Collum was always surprised when his anger and sadness flared. “Where else would I be? When you left, there was nothing. Nothing in this world to hold me.”

“So you’re getting out while you can,” Rachel said.  
“Goddamn selfish bastard. The rest of us have to hang around for the world to end.”

“The world isn’t going to end,” Collum said, and cursed himself. All my degrees in psychology and I can’t acknowledge her pain...I have to explain it away....

“That’s what everyone thinks,” she said. “It’s too fucking insidious. We can’t see it because we’re in it. Maybe it won’t happen in our lifetime, but I pity the generations that follow us. The end will be a mercy.”

Collum opened his mouth to tell her he understood, but Rachel said, “Don’t even don’t talk to me about progress. It’s too little, too late.”

“So why pour yourself into this?” he asked. Fuck psychology. “Why bother protesting a private, non-profit space exploration program?”

“People are getting diseases that only people with AIDS and cancer got before. And you’re going to space. On my good days, I think our son is the lucky one.”

## EpsIndi Present 9

*"How wonderful it is that nobody need wait a single moment before starting to improve the world." Anne Frank*

Saavi was weary of dreaming.

“I’ll wake you soon,” Flagship said. “There is one more dream for you to process before you deal with unfiltered reality.”

Saavi relished the sense of movement as the dream took her through the ship. She imagined the tiny contraction of her actual muscles, like when her churra dreamed of chasing spiral cooties.

The dream brought her to Kaden’s holding cell in the Brig. She gazed at him with unabashed curiosity, appreciating what a

fine man he was. He was Ahlan's friend, she recalled with a pang of grief.

His sirphin brightened when he saw her and then he began to glow with a faint blue light. Saavi recognized the same radiance that shined in Gameya's sirphin and burnished the Stream moderator.

"The Refiner has found in me a willing host, and I will do my part," Kaden said. His voice was formal, stylized, and Saavi thought it was an artifact of the dream.

"Gameya wasn't suitable for the long arc of this task," he said. "Her motives are sincere, but, despite her pretty speech about the universe evolving, she lacks the courage to host the pattern that will purge and refine the universe at every scale."

His words did not sound like the Kaden that Saavi knew, not at all. They triggered her memory of the dream that placed her in the vineyard. Hadn't Chava Rosenberg said something about a host?

Saavi's heart pounded. She hated dreams about uncertainty and unfinished business, about failing some urgent task because she couldn't keep up with demands. These dreams and their demands were all blurring together.

"Try to remember, the Refiner is not your adversary," Kaden said. "Our adversaries are those who desire this age to continue without restraint or consequences or sacrifice or humility. Consciousness is shaping the universe at every scale. Its processes must model the quantum structure from its finest order to the galaxies."

In the space between heartbeats, Kaden faded and the dream took Saavi back inside the stasis pod. The light brightened, illuminating the ceiling of the stasis chamber. Her heart was still racing, blood was pulsing in her ears, and the niri membranes loosened around her.

"*You are awake,*" Flagship said. "*This is not a dream. I will connect your link to System now.*"



*“I apologize for stimulating your sirphin,” System said. “It was necessary, to bring you out of charta. Gameya has searched Flagship. She didn’t find what she was looking for, and for that, she is devastated. Circumstances are precarious. I woke you because you are the only person who can help.”*

Indeed, Saavi’s sirphin prickled beneath her skin, and her thoughts flitted between snippets of dreams. In the spaces where family link bonds should be humming, the silence was thick. Bodhi was in her arms, snug in his sling, tiny and warm, and her breasts tingled with the lactation letdown reflex. *“Bodhi needs to nurse,”* she said.

*“Quickly, then,”* System said. *“Gameya is on the Bridge, and the returning Base commanders are hailing for permission to dock. The Najaam Fleet commander is still waiting for an explanation for the wormhole, and his patience is wearing thin. Gameya’s biosigns register as reactive depression. She is not up to the task of command.”*

*“Then that dream was real?”* Saavi asked. *“Gameya actually threw Declan in the Brig?”* Saavi sat up, and one side of the pod retracted. Cradling Bodhi in the sling, she stepped out on rubbery legs. The sight of the other stasis pods gave her a shiver.

Flagship directed her to the exit, and she found a bench just before her legs gave out. Trembling with weakness, and jittery from the stimulants, she sat down. Bodhi roused and she gave him a breast.

*“My mind is like a bag of sand,”* Saavi said, distracted for a moment by the faintly pleasant tug of Bodhi’s suckling. *“Did we really launch a message drone through the wormhole to CHASE? And a probe to look for the Dactyl?”*

*“Yes,”* System said. *“Those events happened before the charta. And, filtering for dream symbolism, all the events you experienced in charta actually happened.”*

Saavi leaned her head against the pliant ship wall, and felt the faint thrum of its myriad sirphin, inhaling the sweetness of her

milk on Bodhi's breath. A dream fragment swam past her vision and her pulse spiked again. *"Then it's true... the search probe failed! Aborted!"*

*"Yes. But there is hope. CHASE sent a response to our message drone. CHASE detected Ahlan's ship and cloaked it for protection. They await our instructions."*

*"Ahlan is alive?"*

*"Ahlan and the Dactyl's biosigns are active, but the rest of the fleet is missing."*

Saavi clutched Bodhi and restrained the urge to bolt to the Bridge and demand action. Her sirphin flurried to compensate.

*"Does Inirhi know this?"* she asked.

*"I did not break Inirhi's link silence to tell her," System said. "There's nothing she can do at this time. CHASE instructed us to withhold our response for 72 standard Earth hours."*

Saavi knew she should ask System the reason for the delay, but the question didn't seem worth the effort...the answer would require her to bear more unbearable information. Such as troubling wormhole equations.

*"System, I saw wormhole specifications in a dream,"* she said. *"Did they come from this message?"* Blood rushed in Saavi's ears while she waited for System's reply.

*"Do you recall Inirhi announcing an incoming drone in the chaos just before Admiral Declan arrived?"* System asked.

*"I can't sort the events before charta from the dreams, and I certainly can't keep track of all the incoming and outgoing drones,"* Saavi said.

*"That incoming drone is real and I processed it while you were in charta,"* System said. *"By the way, I've created a naming scheme for the drones: CHASE to EpsIndi Query I and its identical counterpart CHASE to EpsIndi Query IA, CHASE to EpsIndi Data I, EpsIndi to CHASE Response I and CHASE to EpsIndi Response I. In my assessment, CHASE to EpsIndi Data I was not a query, and it arrived before we sent EpsIndi to CHASE Response I. It*

*appears to be unrelated to any of the other queries and responses. I gave you its pure data in a dream, with help from...the entities you saw in that dream. But it also contained a message for your eyes only. Now that you're fully awake, are you ready to receive it?"*

Saavi's stomach lurched with the memory of the dream.

*"Yes. The dream confused me. Maybe the message will explain..."*

System's link resonated with a male voice. *"The Refiner has come to bring the Sustainer the patterns she needs in order to understand what the Refiner must do. The Refiner must also choose a host. The Sustainer must do her part, or the Refiner will fail."*

*"Kaden spoke those words to me, verbatim, in a charta dream,"* Saavi said.

*"Do you know what they mean?"* System asked.

*"Can you show me the data again? I don't want to trust my analysis to a charta dream."*

Shimmering graphics bloomed in the space, forming patterns matching the lovely equations she and Rodhyn had spent their lives perfecting, and flowing into sequences completing the wormhole design. Saavi's sirphin sang a melody she'd heard many times, but when she studied the design for structures dependent upon exotic matter, the harmonies turned to dissonance. Her pulse raced. *"System, I spoke the truth in the dream. The wormhole's stability is impermanent. Surely there was mention of this in CHASE's response to our request? Surely there's an explanation!"*

*"CHASE to EpsIndi Response I did not acknowledge your request for the wormhole specifications,"* System said. *"Perhaps CHASE assumed we would have the data from CHASE to EpsIndi Data I by the time they responded. I concur with your assessment, however. I can calculate the date the wormhole will destabilize..."*

*"No!"* Saavi said. *"Don't speak it aloud. I see it, too. I can't...bear it. You said CHASE asked us to wait 72 hours to answer...CHASE to EpsIndi Response I?"*

*“I did,” System said. “CHASE gave no explanation, but circumstances are precarious on both sides of the wormhole. That’s why I woke you to help Gameya. We must stabilize Base command before we attempt any solution for the wormhole.”*

*“I don’t trust Gameya any more than I do Declan.”*

*“It’s a matter of logistics, not an assessment of character,”* System said.

Saavi pondered her options. *“I can’t approach Gameya without leverage to protect Bodhi—and Rodhyn and Talirha and Jaidha!”*

Bodhi squirmed and popped Saavi’s nipple out of his mouth. How strange it felt to be the mother of a newborn infant. She studied his bowed lips and noticed how the fat pads were plumping his cheeks. His eyes were large and round, fixed on her, and her heart swelled. A thought association drew her back to her mental task. Gameya. *“I often forget that Gameya is First Mother,”* Saavi said. *“She is not fit for the role, but she respects the responsibilities of the office. As Bodhi’s mother, I can beg favor.”*

*“You do realize that action is equivalent to surrender?”*

*“I do,”* Saavi said, and felt a tremor in her sirphin.

*“So documented,”* System said with a tone of formality.

From habit, Saavi searched for Ahlan’s link to settle her decision. Her neural pathways sent a phantom response, and Flagship groaned in empathy.

Saavi re-tucked Bodhi into the sling, and then straightened her vest. *“Direct me to Gameya,”* she said, swallowing her feelings and following Flagship’s directions to the airlock.

The door released with a soft click. Saavi crossed to the other side and waited for Flagship to open the exit.

The airlock opened, startling two guards who snapped into defensive posture. Their sirphin fluttered with confusion, but they quickly regrouped, aiming weapons capable of delivering a mild electromagnetic pulse—the only defense the sirphin allowed.

Saavi dipped her chin in greeting and then met their gaze. “I request an audience with First Mother Gameya ‘ne Minnosh da Declan,” she said.

“We will announce your presence,” one guard answered. “But we can’t guarantee an audience.”

The long walk to the Bridge took Saavi beyond the ship’s bay and through silent, empty officers’ quarters. The air smelled of kelp and the spice of the cultured microbiome sustaining the sirphin. The walls were smooth and unadorned except for glowing sconces and swirling sirphin. Her throat tightened at the glimpse of Ahlan’s duty habitat, but she breathed through her grief and followed the guards through curved corridors.

At the entrance to the Bridge, Saavi saw Gameya, alone with two guards.

Gameya rose from the command chair when one of Saavi’s escorts approached and announced, “Saavi ‘ne Rohsen da Minnosh requests audience with the First Mother.”

Gameya’s sirphin displayed surprise, sadness, fear, confusion, and finally relief. “Granted,” she said, and walked slowly toward Saavi.

As if standing outside her body, Saavi saw her herself holding Bodhi, face to face with Gameya, regarding her with large, violet eyes. She felt tenderness for her body. It was such a willing host.

Gameya’s sirphin were muted, her stance hunched like someone who’d just received a gut punch.

“You had the Refiner’s strength for a time,” Saavi said. The words came unbidden, and her mind expanded. She understood, without knowing exactly who the Refiner was, that without its presence, Gameya was not capable of leading Koshim, of usurping Declan’s command, or of deescalating any conflict with Najaam Dunia. Without the Refiner, Gameya was terrified that her sirphin-enhanced guards would turn on her when she needed them most.

<Gentle>, her sirphin said. <Be gentle. Be patient.>

“All you wanted was our safety and security,” Saavi soothed.

Gameya’s sirphin flurried, brighter.

Bodhi woke with a mewling squeak.

“Your nephew is awake,” Saavi said, and her voice thickened with tears. “His father, your brother...is missing with his entire fleet...did your husband even care to mention that?”

Gameya’s mouth opened in an oval of surprise.

“Guards,” Gameya said. “Escort us to the Admiral’s quarters. Saavi ‘ne Rohsen da Minnosh has the favor of the First Mother.”

# Chapter 49

**T**he universe seeks living hosts for consciousness. So says the Singer. Consciousness needs a body. It can flow in patterns, embedded in light and sound and elemental fields shaped by the quantum entanglement of the universe. But these patterns seek a host. Sometimes they converge to embody the deepest wisdom the universe has garnered.

## Earth Present 10

A patch of morning sunlight fell like a caress on Collum's cheek. The smell of patchouli curved his face into a lopsided smile and a warm tingle in his forehead roused him with the sense that something was very close.

He heard Rachel say his name. He took a deep breath before opening his eyes, not wanting to wake if it was a dream.

"Collum," she said again, barely above a whisper.

Rachel's face was inches away from his, and he could see the freckles on her nose, like cinnamon sprinkled in cafe *au lait*. She'd managed to tuck her billows of her hair into her cap and she was wearing the official Reality Earth parka. "I'm leaving," she said. "I have to get back to the front line." She jumped up and scampered down the ladder. Her scent lingered.

"Damn," Collum said. "Just rip off the scab and leave me bleeding."

He moped through breakfast. "What's on today's agenda?" he asked EvaLynn. "I don't know how to hang with you people. You know, after being with Jesus." And Rachel.

EvaLynn suggested a medicinal joint, so Collum followed her to the loft.

“I don’t feel any smarter,” she said, as she twisted the end of the joint and admired her handiwork. “I hope this little diversion doesn’t destroy any of my new brain cells.”

Collum blew a puff of blue smoke into the air and watched it float to the circle of sky at the top of the loft. “I do feel smarter,” he said. “My brain feels stretched. But I’m afraid next time I’m not going to want to come back.”

The scent of patchouli mingled with the cannabis aroma. Collum leaned in and sniffed EvaLynn’s neck.

She swatted his nose.

“What is it with you women and patchouli?” Collum asked. But EvaLynn’s patchouli wasn’t the same as Rachel’s. Rachel’s skin has its own fragrance that ...He handed the joint to EvaLynn. “How’s Sisar handling all this?”

“He’s in the woods, smelling the leaves, digging in the muck.”

“Speak of the devil,” Collum said, as Sisar’s head crowned at the top of the ladder.

Sisar clambered up and dashed to his pallet. “Where’s my journal?” he mumbled, rummaging until he found his backpack. His nose crinkled as a whiff of pot wafted his way.

“I have the cure for your agitation,” EvaLynn said. “Join us?”

Sisar shook his head. “No time. It’s spreading.” He looked in their direction but his gaze was far away. “The embee,” he said. “And other strains that...cry out to me that the Earth’s holobiomes are...uprising.”

EvaLynn eased to her feet and stepped closer to Sisar. She swept the joint under his nostrils.

He snatched it from her hand and EveLynn led him by the elbow to their little circle of pillows.

Collum chuckled and then recognized the deep melancholy in Sisar’s eyes.



“The young people tell me things,” Sisar said. “I’m gathering samples. The new holobiome is not all good. There is a sickness...”

Thomas’s head and torso emerged from the ladder.

“Collum, you have a visitor,” Thomas said. “Come down and meet him. And then, enough of this sitting around getting high. The sun is warm. There are fences to be mended. Outside, all of you.”

A square-jawed man seated in the great room turned to Collum with haunted eyes, extending a hand in greeting. “Tyson Bennett,” he said. “Call me Ty. I’m scared shitless and I want to know why.”

“You can tell Collum your story while we work,” Thomas said. “Maybe this time, I’ll learn the truth.”

EvaLynn and Sisar joined them and followed Thomas outside into golden air spicy with damp, fallen leaves.

“I’m going to show you how to weave saplings for a garden fence,” Thomas said. “Tyson Bennett is going to talk. I am going to listen.”

“The Meskwaki use wild grapevines to fill in the gaps,” Tyson said. “It’s kind of pretty. Not as pretty as the desert, though. I guess a person’s always partial to the place they grew up.”

“I grew up in California,” Collum said. “I like New Ontario better. You?”

“Albuquerque. Went back recently. That’s what I want to tell to you about. It’s a long story.” Ty swiped his forehead.

“You’re not drinking enough, Mr. Tyson,” EvaLynn said. She pointed to Ty’s water bottle.

Ty took a drink. “I was the one who let AFP scan and kidnap Chava,” he said.

“Whoa,” Collum said. “Back up. Start over.”

“Which part?” Ty said. “I’m not proud of it. I let AFP do a Full Immersion. A map of her body and nervous system under an anesthetic that makes you talk.”

“So you’re saying you’re an asshole,” Collum said.

“That’s not the half of it,” Ty said. “I also chased her with a helicopter halfway across Iowa. Until the Meskwaki intercepted. They took Chava, and my partner defected. They zapped my link and let me go. It took me two weeks to get to South Bend. That’s where AFP was happy to use me as a source for their media scare tactics and then hang me out to dry. So, imagine. No job. No home. So I thumbed my way to Albuquerque. I wanted to see if anyone from Sandia was still around. My dad worked for Sandia back in the ‘forties. He helped designed the Hub, you know. It was designed as a defense fortress...but that was before the NAU got ahold of it.” Ty took another long drink of water. “I was pissed off and restless so I kept going west. Went straight on to Zuni. I think I was still haunted by that encounter with the Meskwaki. Out in the desert, under that clear sky, I saw them. The Thunderbirds. They spoke to me. Told me to go back. Said I’m needed here. So it’s your turn. Tell me what the hell is going on, and how can I help?”

“Well, EvaLynn,” Collum said, “I think this is your jurisdiction.”

“Thunderbirds, eh?” EvaLynn said. She took off her gloves and faced Thomas. “We’re the ones who sent Chava to Epsilon Indi through a wormhole and lost her,” she said. “Along with nearly 300 other people. So, maybe we’re the assholes.”

Thomas stared at EvaLynn. Collum took a step closer to her, and then stepped back, ashamed of the reflex to protect her.

Tyson pursed his lips and exhaled. “Then what the hell are you doing hanging out here, smoking weed and tripping?”

“We’re trying to save our organic quantum computer,” EvaLynn said. “What else would we be doing?”

“You need to get me into CHASE,” Tyson said. “Based on what I saw on Chava’s scans and what you’re telling me, AFP’s conspiracy theories are pretty lame compared to reality.”

“It’s time for all of you to leave our land,” Thomas said. “Send my sister back to me.”

“But we need one more dose,” Collum said. The words hung in the air as the silver haired messenger appeared, solid and real.

“We’ll give the final dose to you on the way,” the Messenger said.

Collum stared. “We? When did you get involved with Bailey? Hell, we don’t even know what you are.”

“The one called Bailey is under duress,” the Messenger said. “We must restore him as soon as possible. Tyson comes, too.”

“You know my name?” Tyson asked.

“I’m the reason you’re here,” the Messenger said. “Your former associates are about to take over the Base and CHASE needs you.”

EvaLynn’s jaw dropped and her gloves slipped to the ground.

“CHASE needs me?” Tyson countered.

“One of your understudies is in command,” the Messenger said. “She learned well.”

“But AFP can’t just waltz into Ojibwe First Nation and take over CHASE,” EvaLynn said, locking eyes with Thomas.

“Why would the Ojibwe First Nation interfere?” Thomas asked, standing with legs spread and arms crossed.

While Collum packed to leave, Bailey’s lament about consequences replayed in his mind while the idea of AFP taking over CHASE ricocheted with no place to land. “There has to be something we can do,” he told EvaLynn as clambered down the ladder. “Does Casandra have any connections? Surely she has some favors she can call in.”

“We’re not in a position to call in favors,” EvaLynn said. “We broke treaty. But the more I think of it, I’m wondering if the AFP’s presence will actually work in our favor.”

Collum didn’t press her for details. He knew her answer would spin his head into more questions.

Thomas was absent when the group set off for CHASE. So was Rachel. Collum felt awkward and clumsy, like a child who'd just finished a growth spurt and couldn't coordinate its mind's intentions with its body.

As if he could read Collum's mind, the Messenger said. "What's done is done. The plan is unfolding. For your protection, I must use unorthodox methods to transport you to Base. Everyone gets a dose of psilocybin. Tyson, as well. It will make the trip—pardon the pun—bearable."

When Collum next opened his eyes, he couldn't see anything beyond arms' length in a space that glowed phosphorescent green. "Anybody here? Where am I?" he called, and his mouth and nose filled with dank air.

"We're all here, Collum," EvaLynn said. "With Sisar and Ella. Winona's here, too. And Tyson. And the Messenger. This is the shelter for Bailey's organic matrix. It's time to fix Bailey."

"Last thing I remember was being part of a data stream," Collum said. "And chatting with a quantum bit before we all fell head first onto couches around a brazier and shared a hookah and sipped Turkish coffee. With Jesus, Satan, Vishnu and Siva. I want to go back—we were having a great conversation. My God, Vishnu was beautiful. A naked woman with psychedelic skin. I know, I know, Vishnu isn't a woman. But damn, this time, she was. And Jesus—" Collum laughed so hard, he snorted. "Jesus was an alien dolphin as big as a ship." He wiped his nose with his sleeve. "Oh, and it gets better! Siva and Satan kept changing places and asking if everyone was comfortable while they kept the coffee cups and the hookah bowls full." Collum's throat constricted and he felt tears spill onto his cheeks. "I lost Rachel," he said.

EvaLynn came to Collum's side. His eyes now admitted enough light to make EvaLynn's face look gaunt, and he saw a pale, flickering column beside her.

"Hey, Messenger," Collum said. "is that you? What happened to your body?"

“He doesn’t need it here,” EvaLynn said.

“For this task, I’m a merger of several messengers,” the Messenger said. “To function at our highest level, we need a human host. If it isn’t possible to inhabit a host, we merge our patterns.”

“Duct tape and baling wire,” EvaLynn sighed. “Are you sure it’s enough to protect whoever draws the short straw?”

“What are you talking about?” Collum asked.

“The booby-trap program,” EvaLynn said. “The self-destruct trigger. Who’s going to receive that file?”

“I will intercept it and disable it as I divert Bailey’s data to each of you, based on your compatibility,” the Messenger said.

“You can do that?” Collum asked.

“You all need more psilocybin for the data transfer,” the Messenger said.

“Me too?” Ty said.

“You’re not getting any data,” Winona said. “And someone needs to stay sane and hang in there with me.”

“I’m not getting any psilocybin, either,” Ella said. “I don’t need it.”

“You can’t do Bailey, but you can do the Messenger?” Collum asked.

“Be quiet, all of you,” Ella said. “You’re going to make me scream.”

EvaLynn squeezed Ella’s hand. “Courage, Ella.”

“Courage?” Ella said. “I feel safe here. Not out there with the AFP stomping around and turning on lights and yelling at my mother.”

“Your mother is holding her own,” Winona said. “Let’s get Bailey fixed.”

“Ella,” the Messenger said, “are you ready to receive the data?”

Ella nodded.

Collum drank the concentrated tea. Bailey's dreams, his conflicted orders, and his personality programs flew into Collum's brain like a flock of tiny creatures with bright, spiral wings, and broke into data points. They sang with Chava's voice.

Ella squealed and clapped. "I hear the song," she said. "Aaaahhh....I'm floating...I get it....I get it...." She drew a wide circle in the air with her index finger and then stopped and grabbed EvaLynn's hands. "I already knew this," she said. "I met them before."

But EvaLynn stared ahead, reciting numbers and scientific terms like she was speaking in tongues. "These data are multiples of 137," she said, taking a deep breath. "The fine structure constant. Holy rapture! I'm getting another round." She pursed her lips and exhaled in a slow stream. "It involves an auspicious day."

"What is an auspicious day?" Ella asked.

"A day Hindus believe is favored for fortune," EvaLynn said. "They're usually chosen for weddings or betrothals."

The layered chorus in Collum's head shushed. "All the divine covenants are marriage contracts," he said.

"But you don't believe in the divine," EvaLynn said.

"I'm sorry, EvaLynn," the Messenger said. "I found unexpected data. Please assess for Ella's capacity to hold them."

"The data are singing about a new cycle," EvaLynn said. "This cycle will end. All things will become new."

"New creation?" Collum asked.

"Yes, Siva has spoken, and my bubble has broken," EvaLynn sang to the tune of *Morning Has Broken*. "I need Ella to help me bear it," she said as she fainted.

# EpsIndi Present 10

*“You cannot believe in God until you believe in yourself.”*

Swami Vivekananda

Saavi followed Gameya to the Officers’ Deck, where the guard admitted them to the Admiral’s quarters.

“How long before we can expect to receive a reply to the probe Inirhi sent?” Gameya asked after the door swooshed shut. Her sad eyes were more focused than earlier, but her speech was hard for Saavi to follow, so different from the flow of link-speak.

Processing Gameya’s question was like slogging through a dream, causing Saavi to second guess her answer. There was always a hidden expectation in anything Gameya said, at least to Saavi. It wouldn’t be prudent to tell Gameya about CHASE to EpsIndi Response I. She hedged. “I know how long it *should* take,” she said. “But I don’t know all the variables that could delay the response.”

Gameya flopped on the bunk. “I’m so confused,” she said. “And afraid. Something has sucked the life out of me.”

Saavi felt a muffled twinge of sympathy, but she suspected her sirphin had manufactured it. It was best not to let down her guard.

“I don’t know how I managed to throw Declan in the Brig.” Gameya said, raising her arms above her head and gazing at the ceiling. “The barrier caught him as if I conjured it. It wasn’t part of my plan, and if I’d known Ahlan was missing...”

Her conversational tone was beginning to set Saavi’s teeth on edge. Never had Gameya spoken to her as if she was a peer or, for that matter, with the warmth due a family member.

Gameya’s eyes softened and then narrowed. “Now Fleet Central and Najaam Command are jumping down my throat and I can’t very well tell them Declan is in the Brig.” She pressed folded hands to her lips and stared across the room. “I must maintain the

appearance of being in control. So the full Base crew will support me when it returns, you understand.” Shew drew out the last phrase as if Saavi was supposed to understand the insinuation.

“If there’s any hint that I’ve failed, I won’t be able to use you and Rodhyn effectively,” Gameya said, wringing her hands. “And I’m afraid the chaos at home will get out of hand.”

Saavi’s sirphin fluttered in a stress response; an idea took shape as the adrenaline cleared her head. “With all due respect, if you want to maintain the appearance of control, I suggest releasing Inirhi and Kaden,” she said. “Let them carry on their duties—under guard, of course.”

Gameya’s mouth tightened. “That doesn’t solve the problem of my husband. I can’t place him under guard.” Something flickered in her eyes. They drooped in the shape of unfeigned sadness. Or authentic contrition. Or sincere regret.

Saavi realized it was to guess Gameya’s inner state. And there was no one to help her. Inirhi was the only person Saavi trusted who was awake and in her right mind.

Saavi’s sirphin thrummed a message. <Inirhi is biosavant. She can help.>

Saavi closed her eyes and listened for Inirhi’s link, and then remembered System had dampened it.

*“I will restore it,”* System said.

*“But, Gameya!”* Saavi said.

*Look again,”* Flagship said. *“Gameya is very tired.”*

Gameya stretched out on the Admiral’s bunk. Her eyes closed.

Saavi paced as the hum of Inirhi’s link built.

*“You may contact Inirhi now,”* System said at last. *“I’ve briefed her.”*

Saavi’s vagus nerve warmed and sirphin swirled in her greeting pattern even though Inirhi was several decks away.

*“Your link,”* Inirhi said. *“So welcome.”*



Saavi sensed Inirhi's relief. For a biosavant's sirphin to be dampened...the isolation would be crushing. "*Do you need a moment?*" Saavi asked.

"No," Inirhi said, and Saavi felt her deep resolve deep; it helped her muster courage.

"*Inirhi, I'm with Gameya now. This may sound foolish: we must help her maintain an illusion of control.*"

Inirhi's link hummed with energy. "*Not foolish at all,*" she said. "*I know for a fact that Kimosh supporters are embedded in Admiral Declan's crew and the Base crew. To avert a coup, we need Declan and all his guards in place so Kimosh believes his command is serving Gameya.*" She sighed. "*Beyond that, I have no idea what to do. I'm not a military tactician. I'm just a biosavant.*"

Flagship bellowed. "*Just a biosavant?*" she protested. "*You have me and a whole fleet at your command.*"

"*That's the problem,*" Inirhi said. "*I don't know how to use you.*"

"*Use the power of our intelligence. Our sirphin,*" Flagship said.

"*To what end?*"

Saavi studied Gameya's relaxed face. "*Flagship,*" she said, "*you seem to be able to induce a charta that makes humans docile and suggestible. Can you sustain it, Base-wide?*"

"*Indeed. I can induce a charta that also makes Gameya think it was her idea to release Inirhi and Kaden. One that makes Declan and Gameya believe they're functioning as an effective team and reduces the guards to mere valets. But creating a charta so strong will require all the sirphin at our disposal across the Base and the fleet and you will feel second hand effects. However, I will help you filter them.*"

Gameya sat up and swung her legs over the side of the bed. "I just needed to put my feet up for few seconds," she said.

"*Has it started already?*" Saavi asked Flagship.

“*Just for Gameya,*” Flagship said. “*The Base-wide charta will take longer.*”

“I feel much better after our little talk,” Gameya said with self-satisfied condescension. “Guards, let’s get those officers back in place. I think they’ve learned their lesson. And I expect you to keep them in their place.”

“Are up asking us to release the prisoners?” one guard asked.

“Just the two commanding officers,” Gameya said. “The Admiral needs to stew in the Brig a bit longer.”

“Will you accompany us?” the guard asked.

“No,” Gameya said with a wave of her hand. “Take my sister-in-law. I will meet you on the Bridge.”

The edge of the charta was already beginning to nudge Saavi’s sirphin into compensating patterns as she followed the guards to the Brig.

She passed Declan’s cell. He was sprawled on the bunk, slack-jawed and snoring.

“*The charta,*” Inirhi said. “*It’s not a pretty thing.*”

As soon as the security barrier snapped off, Inirhi and Kaden bounded from their cells.

Kaden pulled Saavi aside. His link jarred her with its strength. “*You know who I am,*” he said. “*I am real. This is not a dream.*”

Saavi shivered at the staggering 360 degree view from the Bridge. It started at the gritty edge of the Dust Cloud and curved toward the wormhole’s corona and its shining aperture, beyond which Ahlan languished and the people of CHASE waited to learn how to help him.

The Base-wide charta was hard to buffer, but it had an unexpected benefit: it took the edge off Saavi’s grief and anxiety.

Seated at an immersion console, she clutched Bodhi’s warm, limp body closer to her breast. Flagship said there was no

way to shield him, but that the charta wouldn't harm him. It would, however, delay to the Refining node once again.

Gameya watched from the gallery with eyes unfocused and hands folded in her lap as Inirhi and Kaden took their stations on the command deck with quiet poise under the scrutiny of four guards standing with their arms crossed behind their backs.

“At your command,” Kaden said.

Gameya's eyebrows inched upward. “Commander De Sousa, make sure there are no...glaring gaps in routine operations. Lt. Inirhi...pardon me, your surname escaped my memory...don't you have some communications duties to catch up?” She rubbed her forehead. “It just occurred to me that his crew will find it odd if Admiral Declan is not in command when they return. Prepare a status report for him. I've decided to let him deal with Najaam Dunia, but I want to know immediately if there's any response from Earth.” She slumped, and then took a deep breath and stood. “Guards, take me to the Brig, immediately.”

Two of the guards left with Gameya. The two who remained held their positions, staring at Kaden and Inirhi with dull eyes.

Kaden shifted his gaze to Saavi a moment before she linked to him. “*Has Flagship or System briefed you since she restored your link?*” she asked.

Kaden's mouth eased into a smile. “*The Refiner is working with Flagship and System,*” he said in a language she'd never heard. “*I prefer this old tongue,*” he said. “*Aren't you curious that you can understand it? The Sustainer is also working with Flagship and System. Will you acknowledge who I am? Do you acknowledge who you are?*”

Saavi fell into a tide of music and light and a song older than time. “*The truth is singing in my cells,*” she said. “*Am the Singer? No, I am the Song.*”

*“That’s one of your names,”* Kaden said. *“I have many names, too. Some call me the Destroyer. But I come instead to Refine and restore.”*

*“The plan is in motion,”* Saavi said. Even in her standard language, the words seemed nonsense. She held Bodhi closer, searching for something solid and real, and studied Inirhi’s reaction, realizing Kaden had not included her in the link.

Declan breezed onto the Bridge, several strides ahead of Gameya, with an inebriated sort of poise under the charta’s effect, in command, as if everything was as it should be. He gestured to Inirhi, who gave up her chair, and then sat and crossed his legs and turned to Saavi.

“It’s remarkable to see you on my Bridge, Dr. Minnosh” he said, lightly. “As I told my wife, I would have brought you here in a more strategic manner. If I can trust what she tells me...” and he chuckled. “She says we can’t gain control of the wormhole because the proper information from Earth is not forthcoming.”

“Perhaps we need to re-state our request,” Gameya said, crossing her arms. “In stronger terms.”

“What does the First Mother have in mind?” Declan asked. In charta, his sarcasm seemed overdone.

Gameya tilted her head. “We must state in clear terms that we have a right to look for our missing fleet and a right to defend our system from incoming threats. And we have the means to do both.”

Declan nodded and stroked his chin. “We should send them an invitation to work with us or...” he raised his hands and smiled crookedly.

*“I will not obey an order to threaten Earth,”* Inirhi lamented.

Saavi did a quick calculation. Thirty-six standard Earth hours remained on the request to embargo a response. Her pulse spiked, but the residual charta smoothed it, and her sirphin reminded her to breathe.

Gameya's eyelids tensed, as if the charta prevented her from a full-fledged glare. "Najaam Dunia is breathing down our necks. Why warn CHASE at all? Why don't we just...surprise them?"

"Saavi's sirphin are singing," System soothed. "*The song embeds a code directly accessible to CHASE's Base Artificial Intelligence Link System.*"

"A song?" Saavi asked. "*I don't hear it.*"

"*It's the First Song. It's in your cells, older than time,*" System said. "*I suggest we convene when Declan and Gameya enter their rest cycle to develop a plan. When it is time, I will contact Bailey in his dream language.*"

# Chapter 50

*“Time on earth moves in cycles of four eras, each era lasting hundreds of thousands of years. In the first era, known as Satya, human civilization is enlightened, but things begin to degrade in the next two eras, Treta and Dwapara. When we reach the Kali era (which we are currently in), civilization sinks more and more into chaos and ignorance. At the end of the Kali era, a partial universal destruction occurs, and a new cycle begins again with Satya. The cycle repeats itself one thousand times in each day of Brahma, the engineer of the universe.”* From *About Time*, Krishna.com

## Earth Present 11

EvaLynn’s head was on Collum’s lap and her eyelids were fluttering like she was awake but trying to keep them closed. The Messenger’s pale column faded in and out of Collum’s vision, and the mind-weariness of the situation hit him with a wave of peevishness. “Hey, Messenger,” he said, “am I still under the influence? Is the data transfer over? And do you have a name? I’m tired of wasting syllables saying ‘Messenger.’”

“I don’t require a name.”

“Ok. I’ll call you Nigel. When you’re in a body, you look like a fucking Nigel.”

“You don’t need to curse, Collum Bruce,” Ella said as she twirled strands of her hair into tight spirals.

“Apologies, little sister,” Collum said. “However, you can’t possibly know what I need.”

EvaLynn’s eyes opened and she sat up slowly with Collum’s help. “You need information,” EvaLynn said. “We all do. A status report would be nice.”

“I’ve disabled Bailey’s self-destruct trigger,” the Messenger said. “But I found embedded data in the files given to Ella and EvaLynn that are not safe onboard Bailey’s systems. They cannot be discoverable. I must create redundancies and Collum and Sisar must also take copies of the files. Do you understand?”

“I don’t understand Klein-Gordon radiation, scalar ghost fields or black holes,” Ella said. “But I love trying.”

Before Collum could protest, new data flew into his consciousness like a swarm of q-bits. They formed a line and began to march in formation. Collum fell back against the wall. A q-bit tilted in his direction and said, “We will keep these data compartmentalized for you, Collum Bruce. You have plenty of storage capacity, but it is not beneficial for you to tinker with data that—”

“I know how I’m wired,” Collum said. “Just dump the data. I’ll try to ignore it.”

Sisar’s eyes were wide, and he was smiling.

“It is done,” the Messenger said at last. “And I must take my leave of you. I’m needed elsewhere.”

“Not so fast, Nigel,” Collum said. “You can’t leave until we’ve restored Bailey. What are we supposed to do with these files?”

“Help is coming,” the Messenger said.

“What does that even mean?” Collum said.

But the Messenger’s column of light winked out.

The room’s ambient, green glow brightened, and Bailey’s voice announced. “I’m awake,” but the statement lilted like a question. “I ran diagnostics and found that several programs were not restored. Most notably, the files for the wormhole design. Was the procedure unsuccessful?”

“The procedure was successful, Bailey,” Winona said, “The self-destruct trigger was disabled. However, we found new information that can’t be discoverable in your systems. We’re

holding it along with all related files and programs until it's secured."

"I'm happy to be back in service," Bailey said, "but I'm disappointed that I'm not fully restored."

"Back in service?" Collum said. "You're not a fucking elevator. You just survived the equivalent of brain surgery. Welcome back, brother."

"Yeah, welcome back, brother," Ella said. "I'm disappointed, too. We won't be able to do the Deep System Analysis and complete an index of missing and corrupted files."

EvaLynn blinked and rubbed her eyes. "Ella," she said.

"I know, I'm talking to Bailey," Ella said. "I can follow Bailey now. He was inside my head, do you get it? He's real. You know? His insides are good."

\*

Bailey expected to do a quick sync of the data recorded by the proxy program, but he encountered a glitch and paused to ping Winona. *"I'm unable to complete the proxy program integration," he said. "I have no categories for records of AFP tanks and armored personnel carriers moving onto Base, or for briefings led by Tess Clemons as if she's in command. Perhaps if I were fully restored—"*

*"Be glad you're not," Winona said. "The AFP are demanding the wormhole specs."*

*"The only acronym in my data base for AFP refers to the America First Party, and there are several startling references to it in the proxy data," Bailey said.*

*"That's right," Winona said. "There was a soft coup while you were out of commission. AFP is in charge now."*

*"Your biosigns are ambiguous and this news strains my plausibility structures," Bailey said.*

*"What, you can't interpret cynicism? If my memory serves, you were the one who warned me about Casandra's theory that the*



*NAU was using the AFP. Seems she was absolutely right. I guess it's not easy for a nation to keep up a democratic socialist facade while it's raising an army and building a fascist regime. But lucky for the NAU, the AFP was already doing both."*

*"I would have expected Thomas to turn the AFP away."*

*"Did I mention tanks and troops?" Winona said. "Besides, CHASE is barely on speaking terms with Ojibwe First Nation. CHASE knew there would be consequences for the wormhole. But this is not the scenario we rehearsed."*

*"Pardon my incredulity," Bailey said. "AFP comes in with tanks and troops with Tess in command? She's hardly had time or experience to move up the ranks."*

*"No comment," Winona said.*

Bailey had barely recovered from his conversation with Winona, when America First High Command hailed, demanding to speak to Tess.

He summoned Tess to the command ready room and installed her at the immersion console. "Incoming call for your eyes only," Bailey said, as he secretly linked Casandra and Winona.

But instead of an officer from AFP High Command, the image that popped from the console was Shang Jin Admiral Lie Ji, whose shaggy black brows bristled in contrast to his slicked back white hair. "We're standing by to receive the wormhole specifications," Admiral Lie said without preamble.

"Pardon, sir, but you're not in my chain of command," Tess said, standing straight as a pencil in her full dress uniform. Her hair was wound in a tight French twist, making her cheeks seem more hollow than usual.

"You are aware of our presence in the Belt? And at the Hub?" Lie said.

"Fully, sir. CHASE is cooperating, but the Science Officer  
—"

“Your patience and diplomacy are admirable,” Lie said. “But they border on gullibility. You have 72 hours to get the specifications. As much as we appreciate America First’s support on the ground, our priority is protecting our interests in space. To that end, we have ships aligned at the Hub. They are capable of crippling the space elevators. We can’t guarantee there would be no human casualties. As I said, you have 72 hours.”

The image blanked and Tess slumped and threw up her hands. “Bailey, what are you hiding from me? Even I know there should be multiple redundancies for important files.”

“May I remind you that AFP’s IT team already scoured my data,” Bailey said. “Perhaps you should be working with the Nair Institute.”

“The Nair Institute,” Tess said, with a long sigh. “I don’t think it even exists. Do I have to start from scratch with interrogations? Get CHASE’s IT department in here. Again.”

Bailey refrained from pointing out the futility of the order.

## EpsIndi Present 11

*“Oh mind, give up the love of duality.”* The Sri Guru Granth Sahib Ji, *Sikhism*

Plodding behind Inirhi to the megafleet’s docking bay in the middle of the Base’s night shift, Saavi was so weary, she feared she’d drop Bodhi, even though he was snug in his sling. She longed to be just a mother, nursing her newborn and celebrating every squeak and gas-induced smile.

Flagship watched from behind the transparent barrier as they approached, gazing with eyes so large and expressive Saavi thought she might fall into them and land in a state unfiltered by language.

*“Flagship and System told me everything that happened while I was in the Brig,”* Inirhi said as they waited for the airlock

to open. *“But until I witnessed Gameya and Declan on the Bridge, the information didn’t seem real.”*

*“So, you woke Jaidha and Rodhyn to help us devise a plan?”*

*“I woke Talirha, too. In case you need help with Bodhi.”*

Flagship sang a low note as Saavi and Inirhi came aboard. It rumbled in Saavi’s sternum until they reached the deck where Callya was concealed, and then faded as Callya raised her lights to reveal Saavi’s waiting family.

Talirha reached for Bodhi and Saavi placed him in her aunt’s eager arms.

Rodhyn rose slowly from his bench. His sirphin swam a languid pattern, and their broken stars barely blushed. His eyes were still limpid, with dilated pupils. *“The mysterious dream emissaries haven’t altered my stance on traversing the wormhole,” he said. “My reasoning is sound. Perhaps if they would speak to me directly...”*

From the Bridge, Kaden linked a surge of warmth for Saavi alone. *“Emissaries...”* he said. *“I like Rodhyn’s word for us.”*

*“My dear uncle,”* Saavi said. *“What other choice to we have? Does anyone really believe the charta is strong enough to override Gameya and Declan’s aggression? They aren’t mobilizing to rescue the Dactyl fleet, and they’re not defending EpsIndi from Earth. They’re fighting for access to the wormhole. Najaam Dunia is still waiting for answers to figure out how to compete. And the Dactyl fleet is still missing.”*

Kaden linked again to Saavi. *“Mere game pieces,”* he said. *“Useful to advance us to our true purpose.”*

*“No,”* Saavi answered directly to him. *“You’re wrong. They’ll start a war with Earth, and destroy any opportunity to work with the wormhole designer to avert the wormhole’s collapse.”*

*“I say again,”* Kaden said. *“All useful to advance our true purpose.”*

Saavi felt the blood drain from her face.

*“Saavi, your points are well-taken,”* Inirhi said. *“Kaden, you are the only one of us with tactical experience. What do you say to Saavi’s concerns?”*

*“Let Declan think he’s sending us to Earth as emissaries—even though he’d prefer a show of force—and let’s give Gameya the satisfaction of placing the mega fleet on standby at our wormhole terminus, while she nurses her hope that we fail to get the wormhole specifications so she can impress Kimosh by deploying the fleet.”*

For a few seconds, there was only the hum of the collective links.

*“I may dissent, but I will cooperate,”* Rodhyn said.

*“System and Flagship, can you embed these ideas into Gameya and Declan’s dreams?”* Inirhi asked. She moved to Jaidha and touched her hand. *“We all need a few hours of rest. I’ll summon Saavi and Rodhyn to the Bridge in three arhim. Jaidha, let’s go assess the fleet.”*

At the door of the bridge, Kaden’s link washed over Saavi like an unexpected breeze.

*“The plan bears the mark of my influence,”* Kaden said in the unknown language that Saavi knew in her core.

*“Of course it does,”* Saavi said. *“You helped—”*

*“Stop pretending you don’t know my deeper meaning,”* he said.

The chatter of electronic equipment drew Saavi’s attention to the communication console. Inirhi turned to acknowledge her. Her face was a mask of professional composure, but her sirphin shimmered on high alert.

Declan sat easily in the command chair with Gameya standing beside him. His face brightened at the sight of Saavi, Rodhyn and Jaidha.

“Finally, both professors and a famous biosavant on my Bridge,” he said. “It feels like I’ve been up for days, scouring our plan for errors.”

Gameya patted his hand. “What could go wrong? The megafleet will be standing by.”

“Very well, Declan said. “Commander DeSousa, please brief us on the plan.”

If Saavi could trust her senses, it seemed Kaden was announcing Declan as Flagship’s captain with Kaden as her pilot, enlisting Inirhi to support biofunctions and AI systems, commissioning Saavi to navigate the wormhole transit, and consigning Rodhyn to remain at Base to monitor the wormhole terminus.

*“The time has come for us to compose the message for System to send to Bailey,”* Kaden linked. *“I have a suggestion for the song in which to embed the data...it is a powerful song, indeed.”*

# Chapter 51

*“the old as rebels, the young as wise men/nuns as sinners  
and sinners are golden/low on cancer/another shame to name/  
welcome bairn, welcome to the blame—” For Glory Shall Fail, by  
SteezieSteeze*

## Earth Present 12

Bailey thought he might be a malfunctioning when a dreamlike song interrupted his task flow. Recovering its source took a nano second or two longer than he expected. The signal originated from the wormhole, and its embedded code was like the q-bit’s language.

He processed the data. Its stunning implications triggered a silent yellow alert to Casandra and Winona. When he had their attention, he suggested convening a conference in the secure space of his organic matrix chamber. Casandra approved, and within minutes, Casandra and Winona were sitting cross-legged on the bare floor in the sickly green light with Collum, Sisar and Ella.

“Peripheral brains, reporting for duty,” Collum said.

“I used that term flippantly in the past,” Bailey said. “But I have since repented.”

“Bailey,” Winona said. “I know this is a yellow alert, but, before you proceed, you need to know that Casandra and I are the only ones who know about the message from EpsIndi.”

Collum jumped to his feet, and EvaLynn tugged his pant-leg. “You need to be sitting down for this,” she said.

“You’re correct, Winona,” Bailey said. He cued a recording of Collum and Chava singing *“I Can’t Find My Way Home.”*

“What kind of stunt is this?” Collum snapped.

“I’m trying to soften the blow,” Bailey said. He spoke gently, and launched the first message from EpsIndi as the music faded.

Collum stared without blinking, long after the message finished.

Sisar spoke first. “If this is true, then Chava is dead,” he said.

“My god,” Collum said. “She’s been dead 500 years.”

“We answered this message,” Casandra said. “But we asked the EpsIndis to delay their response until Bailey could be reactivated.”

“That’s why I called this meeting,” Bailey said. “The situation on EpsIndi has become...fraught...and my counterpart on their space Base...used an alternative method to relay a rather poignant message.”

“What kind of method?” Winona asked.

“It’s a song,” Bailey said. “There are data embedded within it. And if you trust me to paraphrase: The EpsIndis are asking if we have a solution for ...what is this...a scheduled wormhole collapse into a black hole?”

“Sorry you had to find out like this, Bailey,” Winona said. “That’s the nasty easter egg the Messenger found in your files.”

“Files we’re holding for you,” Collum said. “But how could the EpsIndis know?”

“A theory comes to mind,” Bailey said, “but, regardless, this helps explain my tampered files and the self-destruct trigger. However, these data are, for lack of a more sensitive term, useless, in your brains.”

“We cannot risk restoring your files while AFP is in control,” Casandra said.

“We may need to reassess that risk,” Bailey said. “The message stated that Epsilon Indi’s fleet commanders are prepared to use force to get the wormhole specifications.”

“Shit,” Casandra said. “Threats on both sides. Shang Jin has given the AFP 72 hours to extract the wormhole specifications from us, under threat of destroying the space elevators. So Tess is doubling down on her Inquisition.”

“But, think about it,” Collum said. “The EpsIndis have been around 500 years longer than us. It's like they're from the future. Maybe they can help.”

“I can't see how,” Casandra said. “We can't expect them to sail into this Shang Jin mess.”

“There is also the matter of the stranded EpsIndi ship,” Bailey said. “The message indicated it is part of a fleet comprising five ships, and there is no sign of the other four in the EpsIndi system. The stranded ship at our wormhole terminus can survive for about four more standard Earth weeks if it is, indeed, in...there is a word with no English translation...charta?”

“We can't just leave that ship hanging out there!” Winona said.

“Tread carefully,” Casandra said. “Denzel has relapsed, back in Sick Bay. I will be fully responsible for any of unprecedented choices we make.”

“Even if we could cloak a ship and go rescue them, we couldn't get there in time,” Bailey said.

“Why hasn't anyone let Bailey tell us the whole message?” Ella asked. “Everyone keeps interrupting him. You're going to make me scream.”

“I have indeed provided its salient points,” Bailey said.

“You said it's a song?” Collum asked. “I want to hear it.”

“Can you play it for us, Bailey?” Casandra asked.

“Very well,” Bailey said.

Winona began to rock back and forth with the cadence of the song. “Bailey, what's wrong with you? You know this song.” She began chant in Ojibwe. “It's the Traveling Song,” she said.

Bailey's emotional processors sent a flurry of conflicting responses.



“But,” Collum protested. “Isn’t the traveling song... a funeral dirge?”

“Every death is a new beginning,” Winona said, and she seemed startled at herself. “Kapila died. Maybe this song is... from him. Letting us know he made it to the other side.”

The song faded. “Now, do you want me to repeat the points of the message?” Bailey asked.

“Let me,” Winona said. “I heard it... with my heart.”

Bailey would have told the group that the EpsIndis said they appreciate CHASE’s predicament because the search drone they sent to Earth’s system deactivated when it encountered the Shang Jin fleet at the wormhole terminus. He would have explained that the EpsIndis understand the stakes because they’re facing a similar threat from their own fleet Admiral. He would have stressed that the EpsIndis desire a peaceful solution despite their leaders. That they have a plan to rescue their fleet and help CHASE save the galaxy from the wormhole collapse.

But Winona said none of those things. She simply stopped chewing her ponytail and stood straight and tall, turning her face almost imperceptibly to rest her gaze on Collum, and then EvaLynn, and then Casandra, and finally, Sisar, like a blessing. “The powerful miigi whose presence can’t be survived has appeared across the expanse,” she said. “And the miigi who balances that terrible presence is... emerging. If we’re wise, we’ll smooth the way for the EpsIndis as they cross the expanse to bring the miigis to us.”

## EpsIndi Present 12

*“We come spinning out of nothing, scattering stars like dust.”*  
Rumi

Flagship slipped from dock, bringing Saavi nearer to Ahlan. As the wormhole drew closer, Saavi stared at its rainbow corona, fighting the sense that the wormhole was drawing her independently of the ship. Just an anthropomorphism, she guessed. A way to cope with something beyond her mind's capacity.

At her station, with Declan in the command chair, Kaden at the helm and Inirhi at the science console when the moment for transit arrived, Saavi felt tiny and inadequate. She calmed her mind by brushing the gentle milieu of link bonds, including Bodhi's, in charta below with Jaidha.

Callya's link flowed among the others, except for Kaden's. To avoid compromising his response to Declan's orders, he wasn't told that Callya was onboard.

Under the charta's influence, Declan spoke gently. "Saavi will alert us of any anomaly. Flagship will cloak when we emerge."

The wormhole shimmered ahead. Saavi held her breath. She hoped there'd be no pain or disorientation, and that her dream was true and the wormhole was stable for now.

Entering the terminus felt like popping through a soap bubble. Saavi looked for Kaden. His face was frozen, his mouth agape. The instrument lights behind him glowed flat and motionless.

Saavi tried to move her hands, but they seemed to belong to someone else. The longing rose up to sweep her into a slow, painful arc that shattered in a light-burst of pleasure and joy. She swam in the waves and particles, completely undone.

Where is Saavi? she asked

She is the waves and particles, came the answer.

How will I find her?

You will find her in the Song.

The waves formed eddies that sang about love and forgiveness, about losses and failures, about joys and regret, and

about birth and death and renewal. <Earth needs this song>, her sirphin said.

Saavi flowed between three ripples that fit like a groove worn before time began. It seemed right to find Ahlan there. And Bodhi. And Rodhyn and Jaidha. Chava and Bree. Saavi touched the edge of Inirhi's awareness, and then found Kaden and Callya.

Flagship re-formed around her and her viewport filled with stars and the night side of Jupiter in Earth's solar system.

Flagship announced, "Cloak engaged."

Saavi shook herself and blinked several times. Her chair felt substantial, but objects around her seemed less opaque, as if the wormhole had claimed a layer of concrete reality.

Kaden and Declan were shaken and pale and Flagship was announcing the status report as Inirhi's fingers flickered in the data.

"Yellow alert." Flagship said. "Wormhole transit complete. Ship crew and passengers nominal. Proximity alert for several unidentified vessels and one cloaked object. The unidentified vessels did not react to our presence."

Saavi's sirphin retuned. Ahlan's link bond brushed her senses, languid, non-verbal. She reached and found Dactyl's link.

"The cloaked object is the Dactyl," Inirhi confirmed. "Dactyl and her crew are in charta, rationing reserves."

"Then the Dactyl will remain where she lies," Declan said. "It was never my plan to rescue her, and now, in the presence of those ships, it is out of the question."

"*I will not sacrifice the Dactyl,*" Inirhi linked.

"I will not sacrifice Ahlan," Saavi said.

"*Stand down,*" Kaden said. His voice was not his own and Saavi suspected the link did not extend to Inirhi. It launched epochs of Saavi's memories, fresh from the heart of the wormhole.

"*What will you do?*" Saavi asked, unsure what the question meant; searching for its source. "*Is the purging decided?*" The words sounded like a liturgical call awaiting a response.

Kaden's skin reacted with a faint blue glow. *"Have you been Kalki on his white horse?"* he said.

*"I have been his avatar, riding the Isa Ship."*

*"We gave humanity 500 extra years and a fresh start. To what end?"* Kaden asked.

*"What did you learn?"* Flagship's link spoke with a voice Saavi remembered from before time. *"How many souls will it take to satisfy you?"*

*"It's not a quantifiable condition,"* Kaden said.

*"Grace never is,"* Flagship said.

*"What do you know of grace?"* Kaden asked.

*"I am the Isa ship,"* Flagship said.

Saavi gripped the edge of her seat. Why did Kaden call me Kalki? Have I ever been Saavi? She remembered other embodiments; some known by humans, others a mystery. Vishnu, Kali, Mary. Chava. Am I an extension of Chava? What is this conscious source of love and wisdom that must be embodied again and again and again? I am always in the Song, always with the Singer.

Saavi watched Kaden's sirphin flow in self-soothing patterns. The Refiner is not my enemy, she realized as the idea that Kaden held another presence settled in her core. The Refiner holds truth to account. He makes renewal possible. How did he change hosts, from Gameya and to Kaden? He is weary. We both are weary.

*"Yes, I am weary,"* Kaden said aloud and then switched to his link. *"Flagship asked for help from the wormhole designer. Such help is not coming from Earth. I know this because I hold the designer's pattern, but much of it is lost. You must go to Earth and prepare the way for me."*

*"Kapila held your pattern, too?"*

*"We are just servants, helping consciousness,"* he said.

*"For what?"* And Saavi's sirphin sang a melody with a Phrygian dominant scale. It was a song about the law of love.

*"Love is the test,"* Kaden said.

*“This exchange is taking place between two possibilities of space time,”* Flagship said. *“I accept the star name you chose for me: Isa. There are many names for this presence. This one sings to me. Declan will speak now.”*

“Calculate the course to Earth,” Declan said. “Limit the link-chatter and maintain cloaking. As soon as you have the course, lock it in and proceed. I’ll be in my ready room.”

Saavi shivered and her head cleared. She addressed Kaden. “Will you obey that command? And leave the Dactyl stranded?”

“Ahlan is my friend,” Kaden said in his own voice. “It would be risky to bring Flagship alongside Dactyl and refuel her within range of those ships. But that doesn’t mean I won’t try.”

Flagship responded with a plaintive bellow. “Please call me Isa, she said, and then switched her link to Saavi and Inirhi. *“Four of my fleet are joining us. On my command. They are unmanned.”*

“Cloaked?” Inirhi asked.

“Until the proper moment,” Isa said.

“A show of force?” Saavi asked.

“A show of presence,” Isa said. *“In the meantime, Declan will enjoy the deep, rejuvenating effects of the charta. Meet Jaidha in the crew quarters. Take care of Bodhi and get some rest.”*

In Isa’s dim, fishy lower deck, Saavi took Bodhi from Jaidha’s arms and settled him to nurse. Ahlan’s charta-sweetened bond made her drowsy. She roused her sirphin to help her stay alert. *“Soon, my love,”* she said. *“First to save you...and then... even if this plan gets us to Earth, I have no idea what to do when we get there.”*

# Chapter 52

*“I will paint you in a corner/In a room where the light is on/You will see love stands to reason/You can feel it inside I think you’ve known it all along/When I touch you with Occam’s Razor/I will cut you between truth and lie/From “Occam’s Razor,” by Terry Scott Taylor, For Adam Again, Homeboys, 1990, Broken Records*

## Earth Present 13

Bailey didn’t have an opportunity to debrief with Winona before summoning her to Ella’s workspace for her interview with Tess.

“Well, for once, you’re not waking me in the dead of night or meeting me in the bar,” Winona said when he pinged.

“The bar would be the preferred environment for the interaction we need to have,” Bailey said. “But I’ll have to defer my questions about...your interpretation of the data in the song. And you might be craving a drink by the time Tess is through with you. Her nerves are fraying and her interpersonal skills are not what they were 24 hours ago.”

“How could they get any worse? I think this will make my third appearance at the Inquisition. She gets more desperate every time.”

“She really pissed off IT.”

“IT’s always pissed,” Winona said. “Sounds like you are too.”

“Are you commenting on my colorful vernacular? It seemed apt. Anyway, to be fair, Tess is not completely heartless. You’re being summoned for the third time only because Casandra asked to be present for Ella’s interview and Tess said, and I quote, ‘What the hell. Let’s have Winona there, too.’ EvaLynn thinks

Tess was put in command because she has more finesse than most officers of the other gender. Which brings up a thought association: Tyson Bennett. He thinks he can help, so I'm giving him access to the interview transcripts. You should go now. Tess is waiting."

Winona chewed her pony tail as Tess launched into the interrogation. Casandra's brainwaves switched to world leader mode, and Ella climbed into her chair and sat on her knees, wide-eyed and hunch-shouldered.

"Thanks for coming, Ella," Tess said. "So tell me about your role, the information you have access to and what you know about the wormhole."

"That's three questions," Ella said. "Which one do you want me to answer first?"

"Tell me about your job here on Base," Tess said.

"My job is to watch the protesters," Ella said.

"The protesters," Tess repeated.

"That's not a question," Ella said.

"What do you look for in the protesters?"

"I find the patterns: how many there are, their ages, their mood, how they move..."

"Ella's observations gives us real data so we know when we need help to manage the protesters," Winona said. "We want them to exercise their right to protest, but we want them to be safe and we need to protect CHASE's interests."

"I get it," Tess said.

"You should let me answer my own questions, Winona," Ella said.

"So Ella, do you know anything about the wormhole?" Tess asked.

"I know it's about 1.8 AU from earth," Ella said. "I know \_\_\_"

"I mean, do you know how it works?" Tess pressed

“I know the theory,” Ella said. “But not how it really is. Not because I’m not interested. Before, I couldn’t even...couldn’t even be in the Con when Kapila was using the immersion. That’s why I have a separate work space. But I’m better now.”

“Because Kapila’s...not here?” Tess asked.

“No, not because Kapila’s gone,” Ella said. “Because I can do Bailey now.”

Bailey linked Winona. “*We need to divert this conversation,*” he said.

“Ella, let’s focus on your job,” Winona said.

“I am!” Ella said. “My job is the Deep Systems Analysis. I’m holding some of Bailey’s files until we can do it, and the files don’t bother me. Not even a little bit.”

Bailey considered faking an emergency to end the interview, but a real alert jangled the alarm system. “Emergency override for Tess and Casandra,” he announced, and then took a nano second or two to compose the message. “Russia is threatening the use of long-range weapons to target Shang Jin if China doesn’t stand down at the Hub,” Bailey said. “And, please turn on Ella’s monitor cams.”

Ella sprang to her monitor control and adjusted the soft screen. The image showed a mob pressed against the barrier to the space elevator in a throng so deep its edge was beyond the camera’s view.

“The news feeds report similar crowds at the other space elevators around the world,” Bailey said.

Ella stood up and backed away with curled fingers and hunched shoulders. “They’re not protesting,” she said. “They’re shielding. Protecting. Do you get it?”

“That’s enough for Ella,” Casandra snapped.

“Then take care of her,” Tess said. “And what does she mean about holding files for Bailey? My IT team already skewered your IT department and came up with blanks.”



“That’s because Bailey was in charge of the file transfer,” Ella said. “He only chose people he trusted.”

“Then I need names and I need those people in this room, like yesterday,” Tess said.

Ella took another step back and Casandra steadied her shoulders. “That’s easy: Collum Bruce, EvaLynn MacQuoid, Sisar Roca and me,” Ella said, before Bailey or Casandra could intervene.

## Epslni Present 13

Flagship announced that Declan was resting in the deep sleep of charta. Saavi joined Inirhi on the Bridge to reveal Callya’s presence to Kaden.

Kaden’s response was enthusiastic, whether due to the influence of the Refiner or the charta’s second-hand effects, Saavi couldn’t tell.

“So, your plan for Flagship—” Kaden said.

“Call me Isa,” the ship said.

“—Isa will protect Callya while she refuels the Dactyl?” Kaden asked.

“Indeed,” Isa said. “And I will remain cloaked alongside both ships all the way to Earth,” She launched a litany of finer logistical points, including overtopping the smaller ships’ fuel cultures for the trip, prompting Kaden to ask. “How is Dactyl cloaked? She doesn’t have that technology.”

“Bailey did it,” Callya said. “CHASE’s Base Artificial Intelligence Link System. Bailey is the one who’s arranging our safe harbor at the Earth Hub.”

“You’ll need my tactical sensibilities,” Kaden said.

When the time came for Isa to change course and come alongside Dactyl, Saavi settled Bodhi in his niri cradle and joined Inirhi and Kaden on the bridge, straining to find hints of the Dactyl’s cloaked presence against the backdrop of stars. She didn’t realize she was holding her breath until Isa said. “Dactyl is

refueled. She and the crew remain in charta. It's time for you to board Callya. I'll set her course for Earth."

Saavi gripped Bodhi as she boarded Callya, suddenly so tired her muscles ached. She retreated to her berth and fell asleep, her mind buzzing with whispering chatter that sounded like her mother, like Bree, like Chava. The plan is in motion, they said.

But Callya roused her moments later.

"Bailey says safe harbor at Earth's Hub is in peril," Callya said. "A rival nation has threatened Shang Jin, and Shang Jin is planning to exercise its ultimatum even though people are amassing at Earth's space elevators." She projected images of the seven space elevator sites.

"What is the ultimatum?" Saavi asked.

"Shang Jin will destroy the space elevators," Isa said.

"Bailey says the people are acting as human shields to pressure the space armies to stand down," Callya said. "But the people can't get any closer because of the security barriers. For now, they're being treated as a nuisance. But their lives could be in danger if Shang Jin decides to treat them as... Bailey says the term is 'collateral.'"

"But there are so many of them..." Saavi said. "If the people could get past the security barriers, the sheer magnitude of their presence might be enough for Shang Jin to withdraw its ultimatum," Saavi said. "Let's ask Bailey."

"There will be a significant signal delay," Isa said.

Callya shared Bailey's link when he answered. "I can't predict how leaders would respond," he said. "But I anticipated this scenario in my analysis, and even consulted my security expert, Tyson Bennett. He agrees with you and says it's worth the risk to disable the barriers and get the people all the way to the base of the space elevators. But, I'm not capable of disarming the security barriers at space elevators around the whole globe."

"Callya, can you help?" Inirhi asked.

“I will need Isa’s help and everyone’s sirphin to boost my matrix,” Callya said.

“There’s one more thing we need,” Saavi said. “The people need this song. They must sing it while they take their stand.”

Saavi sang the Avahah Rabbah, and then dropped to the floor, curled into a fetal position and sobbed.

For the rest of the journey, Ahlan’s bond link was strong. Saavi could almost smell his skin, feel his warmth, hear his heartbeat. “*Soon*,” she whispered, hoping her link would fill his charta-induced dreams. “*Soon we can be together.*”

Saavi rested, and woke with a tingle all over. Bodhi was awake, cooing, waving his arms, glowing with his signature sirphin. Saavi’s heart sirphin pulsed in joy. He had passed his last Refining node.

Callya sang with Saavi. The song was the Ahavah Rabba.

## Chapter 53

*“Take up your load/Run south to the road/ Turn to the setting sun/  
Sun going down/Got to cover some ground/Before everything  
comes undone/ Comes undone.”* From *Forty Years in the  
Wilderness*. by Bruce Cockburn, *Bone on Bone*

### Earth Present 14

Collum was lying on the floor in his quarters, waiting for sleep, but not quite able to surrender to it.

Snoring in Collum’s bunk, Tyson mumbled something and turned over.

Collum closed his eyes and tried to focus on his breath.

Bailey pinged, and Collum startled back to full alertness.

*“This had better be a message telling me you found a  
hiding place for Captain America,”* Collum said.

*“The message is from Rachel,”* Bailey said.

Collum sat up and gave his heart permission to skip a beat.

*“I accept,”* he said.

Her heard Rachel’s voice, a recording, he assumed. *“The last time we talked, I’d pretty much lost all hope,”* she said. *Especially when I went back to my post and found out the protesters were on the verge of disbanding. They were terrified of AFP, right? But some members of the Meskwaki and Ojibwe First Nations came to the protesters’ camp and begged us to come to a pow-wow. That’s where dozens of protesters admitted they were hearing...I don’t know what they were hearing. I can’t describe it. But I believe them. I think the Earth itself...”* her voice trailed off. *“Collum, are you there?”* and Collum realized the message was live.

“I’m here, Rachel. I’m...just listening,” he said, keeping his voice low.

“The Earth itself is rising up and calling people who...have ears to hear...it’s speaking,” Rachel said. “Are the EpsIndis really coming?”

Collum leaned, in, searching his memory for what he know of news leaks, of Reality Earth’s intel connections. “What makes you ask...”

“Some people say they see things. I know you can’t tell me.”

Ah. More of the mystery. Collum couldn’t fight it or explain it. “I wish I could,” he hedged.

“Don’t stress,” Rachel said. “Love will find a way.”

And then there was silence, except for the sound of Collum’s pounding heart.

“Bailey,” Collum asked. “does this make sense to you?”

“You should ask Winona,” Bailey said.

“I know I should. But we’re all keeping a low profile.”

“Yes, and I’ve been restricting your communication to ‘need to know.’ But I deem it necessary for you to know the EpsIndis are indeed on their way.”

“I figured,” Collum said, too lightly, but the thought made him dizzy, even though he was lying down. “Holy crap, Bailey. How are they going to get to Earth? It’s not like they can simply dock at the Hub.”

“The plan will succeed if I can keep the ships cloaked,” Bailey said. “All Brett needs to do is ensure three docking bays are open in the Najaam Saeid section.”

“Brett?”

“Casandra had the foresight to get Brett Horbach a job at Hub Command before CHASE fell out of favor,” Bailey said.

“What could possibly go wrong with that?”

“Excuse me, Collum,” Bailey said. “I’m getting a priority alert.”

“What now?”

*“Something...engaged...Shang Jin at the wormhole.”*

## EpsIndi Present 14

“Saavi,” Callya said. “Look leeward.”

Saavi turned to see four stately, luminous megaships flanking the seven Earth ships in the space near the cloaked wormhole.

“This is what we are made for,” Isa said. “The Fleet meant us for ill. We are meant for good.”

Isa’s words roused in Saavi an ancient memory, as if they’d been spoken by an archetype before. “What did I miss while I was resting?” she asked.

“The conflict between competing Earth factions has escalated to life-threatening levels and may prevent us from completing our journey.”

“Are we going to attack?” Saavi asked. Her heart clenched.

“No,” Callya said. “We’re announcing our presence.”

“The Earth ships are too small and weak to threaten us,” Isa chimed in. “The laws of physics are not on their side. But that won’t stop them from trying. They’re powering weapons now.”

Isa’s words rang in Saavi’s ears as shafts of crimson light shot from the three Earth ships and bounced off the megaships’ hulls, diffusing like ripples in a pond. The megas strobed rainbow patterns that built to a frenetic pace and then coalesced to a white-hot glow. The stars between the megaships and the Earth ships seemed to bounce like patterns on a shaken rug. All light drained from the Earth ships.

“They used the pulse,” Callya said with a hint of pride.

“They’re hailing the lead Earth ships, asking them to stand down.”

Kaden’s voice linked next. *“All the Earth forces know about our presence at the wormhole,”* he said. *“But they don’t know Isa and Callya and the Dactyl are proceeding to the Hub. Carry on as planned.”*

\*

As the time for docking neared, Inirhi paced.

Callya said, “We’ve prepared for biological hazards and xenophobia. The niri larvae have adapted to create form-fitting biofilters that are barely noticeable. Your Fleet uniforms are ready to satisfy the cultural expectations for covering the body.”

“I’m not worried about us,” Inirhi said. “I’m worried about you. Bailey told me the helper embedded at the Hub could only keep bays open in the rival Shang Jin section.”

“But everything else is in place,” Callya said. “All ships are matching trajectory and velocity with the Hub. Ten Earth minutes to docking.”

The Hub zoomed into view. To Saavi, its glittering jumble of metal and plastic, lights, ships and drones seemed lifeless compared to Callya.

“Docking sequence engaged,” Callya said. “I’m going silent, working with Bailey.”

But instead of silence, Callya’s red alert klaxons blared. “Our cloaking energy pattern has drawn Shang Jin’s attention,” Callya said as an adjacent ship pulled from its bay and turned toward them. “Readying evasive pulse.”

Inirhi pulled Saavi to Callya’s warm, pliant floor.

A flash of red light from the view port flooded the Bridge. Saavi grabbed the base of the command chair as Callya swung to evade. The floor rippled.

“Evasive pulse fired,” Callya said. “Shields up—”

The ship rocked forward.

“I’m hit,” Callya bellowed. “Damaged near my stern.”

Saavi pulled herself up and looked out the view port. Next to the Shang Jin ship, a pixelated wave flickered and coalesced, revealing a tilted and broken EpsIndi Fleet ship with a gaping wound in its prow.

“Dactyl,” Inirhi said. “Dactyl saved us.”

Callya keened. “Dactyl is dead. Her crew is dead.”

Saavi's mind recoiled. Red light and screaming klaxons overpowered her sirphin's attempt to soothe her. Security drones flashed in Callya's viewport and the Hub comm speakers barked unintelligible words.

Base Artificial Intelligence System hailed. "Stay in place," Bailey said. "I'm directing your flagship to the adjacent freight bay."

Saavi gripped the console as Isa pulled alongside Callya's starboard. Isa's hull glowed with the flux of her electromagnetic pulse. A show of presence, Saavi realized, with the part of her mind that rose up in spite of her shock and grief. Isa's presence was more awesome than a show of force.

"Russia and China are standing down," Bailey announced. "A temporary truce."



## Chapter 54

*“I screamed, and lo! Infinity/Came down and settled over me;/ Forced back my scream into my chest;/Bent back my arm upon my breast;/ And pressing of the Undefined/The definition of my mind, / Held up before my eyes a glass/Through which my shrinking sight did pass.” Excerpted from Renascence, by Edna St. Vincent Millay, Collected Poems*

### Earth Present 15

Collum was finally on his way to the Hub. Eight months later than he'd originally planned—a lifetime, if measured by perspective. A spark of bitterness rose from the embers of self pity he still coddled since being cut from the mission. It landed in the center of his sternum, but one look into EvaLynn's wide, blue eyes extinguished it. He caught her excitement in the pit of his stomach, which did a little flip like he'd just jumped off a cliff.

EvaLynn grabbed his elbow and pointed to the mass of protesters at the base of the space elevator. “Watch this,” she said.

The crowd parted at the sight of Tess Clemens and four AFC guards leading the entourage across the tarmac.

“AFC escort. Terms of the truce,” EvaLynn said, as cheer from the crowd nearly drowned her voice.

Collum watched Winona's pony tail sway and catch the sunlight as she walked beside Casandra. When the duo reached the shuttle ramp, they moved aside for EvaLynn and Collum.

Relinquishing her grip on Collum's elbow, EvaLynn stepped onto the ramp. She took a deep breath and faced the crowd, turning her hand in a slow wave, like a homecoming queen. The crowd reacted with whistles and cheers.

“Time to board,” Casandra said. “Any questions?”

Collum swiped his chin to cover a nervous grin.

“What's so funny?” EvaLynn asked.

“Isn’t there an old joke?” Collum said. “Something like ‘how many psychologists does it take to change a light bulb?’”

“In this case, as many as necessary to make our guests welcome,” Casandra said. “You’ll do fine.”

“Just remember to listen to Bailey’s link even though you’ll be able to hear the EpsIndis talking,” Winona said. “You’ll get the hang of it.”

Collum felt like he should salute, but CHASE protocol was not so formal. Instead, he nodded and adjusted the cuffs of his dress uniform. “Lead the way,” he said to EvaLynn.

The crowd’s cheers buoyed Collum’s steps as he climbed the ramp. He greeted the shuttle crew and followed EvaLynn into the blue and silver interior.

“I call shotgun,” EvaLynn said, and claimed a window seat.

It was a strange idiom, older than the light bulb joke, and Collum chuckled. “We’re acting like we’re the ones from the past,” he said as he buckled in next to her.

“I wish I had a joint,” she said.

“I feel like I’m trippin’ already,” Collum said. “All the stuff I’m holding in my head, plus what’s really happening. Shit. You can’t make this stuff up. I can’t even keep track of what’s at stake.”

EvaLynn pressed her face against the window as the shuttle began its ascent. “We are. Climbing. Jacob’s. Ladder.” she sang and paused. “Every. Rung goes. Higher. Higher.”

“Don’t sing the next line,” Collum said. “I ain’t no soldier of the cross. I’m surprised you know that song.”

“But every rung does go higher, higher. Where is it taking us? Who is keeping track of the stakes? We’ve depended on Bailey for so much.”

“The Messenger said help was coming,” Collum said. “The EpsIndis?”

EvaLynn shrugged. “If they hadn’t scared the shit out of Russia and China we’d still be facing Shang Jin’s ultimatum.”

“But how the hell are we supposed to get these files out of our brains so Bailey can work with them?”

“The EpsIndis,” EvaLynn repeated. “Let’s meet them well.” She turned her face to him. It was streaked with tears. “Chava,” she said. Just the name, no elaboration. Collum understood.

Collum thought he was prepared, but when the EpsIndis came aboard, his knees turned to water.

The one called Saavi appraised him with huge violet eyes. Her slender body was at least fifteen centimeters taller than his. Her head was perfectly shaped, her neck long, her cheekbones so high that her eyes looked slanted. Tiny blossoms of teal and magenta swirled on her skin. She carried an infant in a sling, whose skin danced with its own hues and patterns. In a voice that resonated with more than one tone, she said hello and gave her full name: a jumble of syllables that might have included something like “Hava”, and introduced her two companions, also female. The one whose name sounded like Jada smiled and pointed at Collum’s dreadlocks.

Collum returned the smile.

Saavi spoke again and paused intermittently for Bailey to translate. “We will try to make our speech clear. Because our sirphin link our speech, if we are close together, we don’t need to make many sounds. So, speaking with you, we may say too much or too little. Please correct us. Ask questions.”

EvaLynn kept dabbing her eyes. “I’m unfit for this,” she said. “I’m sorry for your loss,” she said to Saavi.

“Thank you,” Saavi said with a devastatingly direct gaze. “We are still in surprise and sadness and confusion. And fear.” She stretched out her arm and pushed up her sleeve. “See my sirphin? They work hard to keep me calm.”

Collum swallowed a new lump in his throat. “Chava tried to tell me what it was like,” he said.

Jaidha said something long and complicated that Bailey translated as, “*Chava brought the microbiome that joined with ours to create the sirphin. We all carry some of her.*”

The one called Inirhi tipped her head forward and said, “Meeting you fills me with song, but I must return to the ships. They need healing and fuel and rest, and your Earth crew is helping locate supplies.”

After Inirhi left the shuttle, it began the descent. As it broke through the clouds, Lake Superior consumed the view. At the base of the space elevator, the protestors’ writhing mosaic resolved into individuals.

Jaidha pressed her palms to the plexiglass. “The people are still shielding?” she asked.

“They won’t retreat until we’re safely down,” Collum said.

“They’ll make a way for us when we leave the shuttle,” EvaLynn said. “But they will be curious. They will stare. Do you want to cover yourselves?” She held up a hooded jacket.

Saavi turned to her companions. Their skin patterns brightened and changed configurations. “We will let them see us,” Saavi said. “We’re grateful for their courage.”

Collum descended the exit ramp first and locked eyes with Winona, who stood on the left side of the ramp, flanked by two AFC security guards whose hands were crossed behind their backs holding tasers. Winona’s chin moved in a slight nod, and, as if she could not bring herself to look at the EpsIndis, she directed her gaze to Casandra and Tess, who waited on the right side of the ramp with the other two guards.

Saavi followed Collum down the ramp and tipped her head to the sky. Her chest rose with a deep breath. “My filter adjusted,” she said.

“I feel the gravity,” Jaidha said. “Like I carry something heavy.”

“You do,” Saavi said. “Yourself.”

The EpsIs laughed, and Collum noticed quick sideways glances, hands covering mouths: signs of self-consciousness.

Cassandra's face crumpled and her shoulders bowed as her chest caved with a quick intake of breath. She recovered and resumed her formal posture to give Saavi a proper greeting.

A new cheer erupted from the crowd as the entourage crossed the tarmac. The EpsIndis halted and raised their arms in greeting until EvaLynn urged them to move on.

They settled in a waiting ATV, with Brian MacLeod as the driver, for the final leg of the journey.

"I call shotgun," Collum said, with a wink for EvaLynn as he took the passenger seat beside Brian.

Brian leaned in and whispered, "I've never seen tattoos like that." He stretched out an arm to compare.

"Theirs are not tattoos," Collum said.

The ATV halted on the path near the Base rear entrance, and the passengers disembarked. The EpsIndis twittered about the textures of the pebbles and the intricacies of the woven patio roof.

Cassandra moved past Tess to the fore and ushered the group into the conference room.

"Fumbling toward an uneasy alliance while the powers above their pay grade are playing nice together," EvaLynn said. Her mouth moved, but Collum heard the words in his head.

"That's not a bad way to describe the situation," he whispered.

"Did I say that out loud?" EvaLynn asked.

"*My mistake,*" Bailey linked. "*Isa just finished upgrading our links so I can fill in what the EpsIs don't verbalize. Bear with me. You did not say that out loud, but Collum heard it in his link.*"

Cassandra took a seat and gestured for them to do the same.

Tess, ostensibly in charge, sat silent and rigid, wide-eyed, thin-lipped.

"I'm sorry our commander isn't here to greet you,"

Cassandra said, filling the awkward gap. "Forgive me if...I can't

seem to look at you directly...I don't know your customs. I'm afraid if I truly see you, I won't be able to turn away."

Saavi glanced at Jaidha. Jaidha nodded. "It will not offend us if you look," Saavi said.

Cassandra turned to EvaLynn with pleading eyes. "Ella should be here," she whispered.

"I agree," EvaLynn said.

Tess continued to stare, still speechless.

"*I'll summon Ella,*" Bailey said.

"*No, I'll go get her,*" Winona said, and left quickly, as if relieved.

The infant roused with a squeak and opened wide, blue eyes.

"How old?" Cassandra asked.

Saavi tilted her head and looked up to the right. "Bodhi is fourteen days in Earth time," she said.

"What you've been through, since giving birth..." Cassandra said. "I'm so sorry for the death of your husband..."

Saavi held Bodhi closer and her eyes seemed to lose focus for a moment. She opened her mouth as if to speak, but shut it again, and lowered her chin. "Thank you," she said. "So much strangeness...I can't find the truth of it..."

Jaidha locked eyes with Saavi, and something wordless passed between them.

The conference room door opened slowly, and Winona took a cautious step into the room, holding both of Ella's hands.

Ella's gaze darted from side to side until she crossed the threshold and then she looked directly at the EpsIndis. Her mouth formed a small oval. "I know you," she said matter-of-factly, pulling away from Winona's grasp. "I saw you. Now I feel you, right here," she said, making circles on her sternum with her open palm. "A happy humming." Her shoulders relaxed and she sat down beside Cassandra, as if completely at ease. "I have so many

questions for you, but the most important one is: can you help us fix the wormhole?"

Collum tensed and stole a look at Tess, who blinked slowly as a furrow inched her brows together. She shook her head as if to clear it, and Collum heard Jaidha's buttery voice in his link.

*"My sirphin found your neural links,"* Jaidha said. *"We can speak this way. Be calm."*

Ella turned large, solemn eyes toward Jaidha and patted her sternum again.

"But Ella doesn't have a link," Collum said.

**"What she has is enough,"** Jaidha said.

Ella took a deep breath. "I used the wrong words, Commander Clemens," she said to Tess. "I meant to say that none of us has all the information about the wormhole. I hope the EpsIndi's can help us fix that."

Tess's brow smoothed and her shoulders relaxed.

Saavi's link found Collum's.

Collum heard Chava singing. He sat on his hands and looked at Saavi as if seeing her for the first time. My God, she's Vishnu. Where is Siva? Where is Jesus? He wished for one more dose of psilocybin. He probed the chorus of links until he found Bailey. "I have an idea for sharing our peripheral brains," Collum said. *"I don't know if it will work, but it's worth a try."*

# Chapter 55

*“According to Hindu cosmology, it is predicted that at the end of the Kali Yuga, Lord Shiva will destroy the universe and the physical body will undergo a great transformation. After the dissolution, Lord Brahma will recreate the universe, and humankind will become the Beings of Truth once again.”* From *Hinduism's 4 Yugas, or Ages,* " by Das, Subhamoy, *Learn Religions*, Feb. 11, 2020 [learnreligions.com/the-four-yugas-or-epochs-1770051](http://learnreligions.com/the-four-yugas-or-epochs-1770051).

## Earth Present 16

Collum took Casandra for a walk around the lake, hoping the change of scenery would take the edge off her wariness.

“You want me to take psilocybin?” Casandra said. “That’s extreme. What if it doesn’t have the right effect on me?”

Collum shrugged. “It’s the best chance we have to prepare you to help us deal with some trippy information,” he said.

“As if you already have all the information? Why don’t you just come right out and tell me?”

“I don’t know the details. But I saw something during the psilocybin treatments.”

“And you expect me to take a mind-altering drug based on that evidence?”

“It’s all I’ve got,” Collum said. “That, and the fact the EpsIndis can access our neural links.”

“I respect you, Collum,” Casandra said. “But, hell, no. You’re a psychologist. You should know better.”

“I know your mind is very ordered and concrete.”

“And I’d like to keep it that way.”

“It’s a controlled dose. I don’t know what you’re afraid of. The psychedelic helped me see what really is, all the way down to the patterns between the particles that hold stuff together.”



“That’s what I’m afraid of,” Casandra said.

“Of course, the way my mind works is to give the patterns names and personalities. The patterns are what you need to understand.”

“What patterns? Seriously, Collum, the only reason we’re having this conversation is because EvaLynn asked me to give you a chance.”

“What else did EvaLynn say?” Collum asked.

“She wants to include Thomas Manitowabi and do it at the lodge.”

“But if we go there, we won’t have Bailey. We need his full processing power.”

“I know. Bailey was quick to point that out to me,” Casandra said. “It’s a moot point, anyway. We can’t go to the lodge because no longer have an agreement with Ojibwe First Nation. But EvaLynn is adamant that Thomas needs to be there.”

Collum listened to a loon call drifting across the lake. He watched a single golden poplar leaf flutter to the ground.

Casandra bent and picked up the leaf. “Why is EvaLynn so sure Thomas need to be there?” she asked.

“I wonder what it’s like to be a leaf and just let go,” Collum said. “To fall into mystery. Thomas has been waiting a long time to fall into mystery. Maybe Winona can get him to come here.”

“I’ll agree to receive the information,” Casandra said with a tremulous sigh. “But I won’t take psilocybin. I like my brain just the way it is.”

Bailey’s matrix chamber felt like a sanctuary to Collum, even if it was a bit crowded.

Thomas was there, and so was Commander Kaden DeSousa, freshly transported from Isa to join Saavi and Jaidha, whose skin shimmered in the greenish light. And the Messenger was there, in his pillar form.

“Good of you to make time for us, Nigel,” Collum said, but he saw the look of wonder on Saavi’s face and regretted the quip.

“My *malak* is here,” Saavi whispered.

“Your *malak* is more than one,” Jaidha said. “I will initiate the charta to tune our minds and augment our sirphin.”

Thomas passed cups of mushroom tea. Collum drank a portion and watched Thomas drain his cup and settle on the floor beside Ella and Casandra.

“I’ve always known your brain was formidable,” Thomas said to Cassandra. “Like Ella’s.”

Collum felt the hum of Bailey’s matrix in the wall at his back. The Messenger brightened and trilled a multi-toned cadence. Collum’s breathing became slow and regular, and his chest felt warm. An invisible hand stroked his cheek and he saw the first letter of Chava’s name, the Chet, as the portal, the doorway to the Ahavah Rabbah. He heard Chava singing it, just for him. The presences he likened to Siva and Vishnu linked him to Casandra, whose mind opened like a house with uncluttered rooms where hammers, saws, lathes and delicate surgical instruments lined up on neat pegs as if they belonged with the fresh flowers and folded laundry.

Vishnu merged with Saavi. Siva merged with Kaden and Kaden began to weep. “I’m so weary,” he said, with Siva’s voice. “I don’t have the strength to orchestrate the end of an age.”

“All the patterns are weary” the Messenger said. His voice was a waterfall, roaring and whispering with a chorus thousands strong. “But your work is done. Kapila made sure of that. And we are nearly spent of our energy.”

“I’m sorry you can’t hear the Singer anymore,” Saavi said. Her voice tinkled like crystal flower petals stirring in a breeze.

“Such is the way of the end,” Kaden said.

“Must it end?” Saavi asked. “In all the beautiful and tragic and hopeful mess of this age, consciousness surged with love and self-giving that have been a source of replenishment. That’s why

the Singer saw hope and bargained for a reprieve.” Saavi began to sing with Chava.

Kaden brightened. “I can hear the song when you and Chava sing it.”

“Then, there is still hope,” Saavi said, but she saw Casandra’s mind flaming red and lifting a hammer.

“Did you just...use us?” Casandra asked. “Like tools?”

The q-bit spun in a space Collum couldn’t locate. “You had ears to hear,” it said, and Casandra’s hammer settled back on its peg. Her mind cooled to blue.

“I have ears, too,” Ella said. “Why couldn’t I do Kapila?”

“Kapila carried the powerful miigi in whose presence people died, in the time before time,” Thomas said. “It would have been too much for you to bear, Ella.”

“Siva was too much for Kapila to bear as well,” Kaden said. “Siva’s power warped Kapila’s extraordinary intellect and religious metaphors, giving him deadly certainty that the age must end.”

“I know this,” Bailey exclaimed. “It fits a hole in my memory. I can see how easy it was for Kapila to manipulate small design changes to ensure the wormhole would destabilize.”

“But our plan to extend the lessons of this age was so elegant,” Saavi said.

Collum fell back against the wall. The room became a shower stall, and he was in the shower with Chava. He blushed, but couldn’t avert his eyes from the spare curves of her body as she bent to scrub her calves. He saw her mind absorb an inky stain of grief offered by her embee as microbes rushed down the drain, and heard her comfort her embee. Her memory whispered of their first emergence like a yearning question, and Collum felt the yearning expand as empathy for other living things that opened Chava to their complexity and intelligence. Collum swayed under the weight of the harmonic that anchored Chava to the sea of consciousness. Its melody acquired halting words, and then the words became a

conversation, always carried by a song. The song became a vision of waves bursting into Saavi's mind, crashing against black, ragged rocks, telling Saavi not to resist, to allow herself to be shattered, as they were being, into sparkling mist, and drawn back into the tide. The flowing, shattering, and reshaping are simply what Is. Collum felt the warm, welcome pain of birth pangs, as a noisy, black, starry sky unfurled. He heard Saavi say, "Do you hear that? It's spacetime. We are living in the Time of Possibility." With each contraction, Saavi shouted something Collum couldn't understand. The q-bit whispered in his ear, "It's wormhole math." "But the time paradox," Collum said. "When did Saavi birth the wormhole?" "In the Time of Possibility," the q-bit said, as Jaidha announced, "You may push when you feel the urge," and a perfectly shaped bubble of pale light appeared in the starry, seashore sky of Saavi's vision. The bubble faded and shrank to nothingness until the next contraction, when it bloomed again and spiked a wheel of colors. Chava's yearning re-awakened, and Saavi rode the arc of its sweet ache and pushed until the sphere in her vision shimmered steadily, its center clear as a window. "Exotic matter. Is enough," Saavi cried. "I see it, in the crashing, shattering, and regrouping waves. Waves of messengers, upholding the quantum state to create regions of negative energy density that keep the wormhole open."

"An interesting adaptation of the Casimir Effect," Bailey said.

"No wonder my uncle and I couldn't discern its source," Saavi said. "There were no physical conductors."

"It was always the voices of the Messengers amplifying the Singer and the song is always the Avahah Rabbah," Chava said.

"But the song was not enough for Kapila," Saavi said.

"It was enough to turn Kapila back to the right path in time to transfer Siva's pattern to the probe he sent to EpsIndi," Chava said. "The transfer cost him his life."

“Kapila’s sacrifice was not so noble,” Kaden said. “He knew Siva’s pattern could not survive without a host that could bear him. Gameya and Declan failed. I don’t know how much longer I can hold Siva’s presence.”

“And Kapila’s actions weakened Siva even further,” the Messenger said. “All of the messengers are weakening and can’t forestall the end much longer.”

“And now, who will judge the age?” Kaden asked.

“Love is not a test,” Jesus said, appearing in the form of Isa. “Love is the point of this age. The lesson is for us, we who hold the patterns, as much as it is for the universe. You know what you need to do,” he said to Saavi, and began to weep.

The Messenger sang the Ahavah Rabbah with a thousand voices. The shimmering, white calligraphy of Saavi’s equations danced into the space, regrouping to show the fading regions of negative energy density.

“I know what must be done to correct the wormhole collapse,” Saavi said, with Vishnu’s voice. “When the time comes, I am here. I am ready. *Hi nei ni*,” she said in Hebrew. “But I can’t do it alone.”

“I am here,” Kaden said in Sanskrit with Siva’s voice. “I am ready.”

“Don’t cry, Jesus,” Collum said. “You’ve been in the same spot.”

“People think God required the sacrifice,” Jesus said. “The Absolute needed to *be* the sacrifice.”

“So, was it enough?” Collum asked.

“It was, and is and will be,” Jesus said.

“It is already changing the Earth people,” Saavi said. “My sirphin tell me there are new voices that should be added to the Song.”

For a moment, there was silence except for a pleasant hum in the air, and then the Messenger announced, “Bailey’s files have been restored.”

Cassandra whispered, “On whose authority?”

“The Singer did it,” the Messenger said. “Now Vishnu and Siva’s self-giving love can mend the rift. By the time your adversaries find the files, we will be in the age to come.”

Collum spent the rest of the day in bed, wondering how much of the vision was true, dreading the answer and desperately wanting the truth. Does joy always come with such cost?

Bailey pinged. “I thought my first big task after being returned to full capacity would be more technical in nature,” Bailey said. “I simply have another message from Rachel. She wants to see you. She wants permission to come to Base.”

“Did she say what she wants?”

“That’s all the information I have,” Bailey said.

“Nevertheless, I know what she wants. She wants you.”

“But, is this the right time?”

“Time is not the issue.”

“Tell her I’ll get the clearance,” Collum said.

Collum spent the next two days with Rachel in a cocoon of ecstasy and grief. Rachel came to him, soft, strong, sweet and salty, a sensory overload of lips and skin and soft breasts and muscular thighs. They laughed and cried and made other noises that Bailey complained about as he added them to his data base.

# Chapter 56

*“The earth, that is sufficient./I do not want the constellations any nearer./I know they are very well where they are./I know they suffice for those who belong to them.”* From *Leaves of Grass*, by Walt Whitman, *Songs of the Open Road*.

## Earth Present 17

Saavi climbed into the ATV with Jaidha, wondering if niri could be bred on this planet. She didn't mind the environment on Base; its infrastructure was partly organic, but metal conveyances gave her claustrophobia. She would prefer walking to Thomas Manitowabi's lodge, but Earth's gravity and her heavy grief made her feel ponderous.

The scenic route Brian MacLeod took to the lodge lightened her spirits. The sun glinted off Lake Superior and the breeze carried the scent of pine.

Jaidha's sirphin danced with delight. “Our sirphin are getting a boost,” she said.

“How do you know this?” Saavi asked.

“I've been spending time in Chava's lab, learning how the local holobiome interacts with our sirphin.”

“And?”

“It's complicated,” Jaidha said. “Chava's microbiome still lives in Beta Colony's soil. Since the EpsIndi trikaryotes assimilated her microbiome's DNA to form our sirphin, I can compare genomes.”

“Are they compatible?”

“Not just compatible,” Jaidha said. “Beneficial. In fact, the Beta Colony genome is the remedy for the kelp blight on EpsIndi.”

“It can't be that simple,” Saavi said. “The sirphin don't dispense cures.”

“You’re correct,” Jaidha said. “But the sirphin will honor our planets’ first steps toward working together.”

Brian parked the SUV under the pines, and Collum and Rachel came to guide Saavi and Jaidha to the lodge, where Thomas met him.

“A lot of people came a long way to speak to you,” Thomas said.

“I hear their voices, whispering with your planet,” Jaidha said.

Behind the lodge, sitting in a circle of blankets under the poplars, people turned rapt faces to Saavi and Jaidha, whose sirphin swarmed to find the proper greeting response.

“We need the Tuning Song,” Saavi said.

Jaidha nodded, and Saavi began to sing. Jaidha’s sirphin tuned to harmonics of the holobiome outside of Saavi’s sensory range, and then Saavi’s sirphin tuned to Jaidha’s.

The people quieted.

A man stood in the center of the circle. Saavi’s forehead grew warm when he looked at her. She turned to Thomas with a question.

“This is my friend Beshkno Fisher,” Thomas said. “His daughter Suksi led the people here.”

“We came to tell you about the voices calling us,” Beshkno said.

Suksi stood to join Beshkno. “Chava, She Who Sings All The Time, gave the voices to us. Will you listen? We have so many stories to tell.”

“We want to hear them all,” Saavi said.

Around the circle, people took their turn. Two women and an elderly man described a kind of chatter, a humming when they were working in the soil and when they ate certain foods.

“Does it frighten you?” Jaidha asked.



“It should,” the man said. “But it feels peaceful. Like being outside barefoot when I was a little boy.” He laughed. “Before the war. Before the Rosenbergs.”

A young woman said her tomatoes told her they were getting blight and she was able to change the mulch in time to halt the spread. “It made me laugh,” she said.

A man named Marcus said he thought his stomach was growling, until pictures formed inside his head. He saw the space elevator and knew he was being called to shield it. “I’d be happy to research this phenomenon,” he said. “I’m a laboratory scientist. I worked with Chava.”

The next days were lovely and Saavi cherished each moment. She kept Bodhi nearby to nurse him on demand and play with him. While she worked with Jaidha with the people chosen for closer study, Collum and Rachel tended to him, often in the same space.

Jaidha sometimes queried Saavi without words.

“I’m not ready to speak of it,” Saavi said, until Jaidha confronted her.

“I can’t bear it,” Jaidha said. “What will happen to Bodhi?”

“I need you to take him,” Saavi whispered.

Jaidha slumped and pressed her hands to her eyes. “Of course. And Talirha and Rodhyn will—” her voice broke.

Rachel came to Jaidha and wrapped her arms around her. She looked up at Collum and then to Saavi. “Could Bodhi survive here, on Earth?” she asked.

“He would live,” Saavi said. “But his sirphin? I don’t know.”

Jaidha tilted her chin up and flapped her hands to dry her tears. “There’s a chance his sirphin would live,” she said.

“What would we need to do to be sure?”

“Take a blood sample and culture Bodhi’s sirphin with the Base microbiome,” Jaidha said in a tear-soaked voice. She covered her face. “But don’t ask me to give up Bodhi.”

Saavi glowed. “If I can bear it, so can you,” she said. “I’m not afraid. I’ve always known this.” (I’ve known it since the longing began), she told her sirphin.

Saavi rocked Jaidha until Jaidha pulled away and touched Rachel’s arm.

“If this is successful,” Jaidha said, and the words quivered like a raindrop gathering enough mass to fall, “I will recommend giving sirphin to you and Collum. Not least because I want to try...to guide your sirphin to induce...lactation.”

The Messenger appeared in the form of the silver-haired gentleman. “Time to go back to Base,” he said. “Bailey and Kaden have news for you.”

Back inside the Con at Base, Saavi felt the chill of the sterile environment. A hologram of Isa’s Bridge filled the space. Declan sat in the command chair. His face was stretched in the sloppy charta smile.

“A pair of Najaam ships has emerged from the wormhole,” Declan said. “But the mega ships are holding them at bay. We’re about to hail them. We want you to witness.”

The Najaam commander did not waste time on formalities. “We came to claim our interests,” he said.

“You’re a bit premature,” Declan said, breezily. “You took a foolish risk traversing the wormhole.”

“We thought if we demonstrate good faith and promote the commercial benefits of an alliance, it might help your cause,” the commander said. “We’d like to meet our sister company, the original Najaam Saeid.”

“In time,” Declan said. “As I said, you’re a bit premature.”

Isa spoke in her plaintive bellow. “My fleet will take these ships aboard until their sirphin are attuned to the sacrifice required to enter the new age,” she said. “Let those with ears hear.”

# Chapter 57

*“Our  
dust  
part  
for  
star  
part  
must  
part  
us “*

*Listen to light, by Raymond Roeseliep, “Haiku”*

## Earth Present 18

As Isa glided out of dock, Saavi was numb, a bit euphoric, yet raw with grief. Bodhi’s link receded, but Saavi heard Ahlan’s sirphin, harvested with the Dactyl’s sirphin, singing inside Isa.

:I’m giving you your first, real, full-fledged charta), Isa said. (You won’t be able to resist this one.)

When Isa was well away from the Hub, Kaden broke the news to Declan. “Saavi and I must return with Isa to the wormhole,” he said. “You and the remaining crew will board Callya. After Isa enters the wormhole, the mega fleet will escort you to Earth. I pray the charta holds or you come to your senses. We need you to keep the peace. We’re dying for it.”

Saavi watched the wormhole grow nearer.

“Do you think there will anyone will see when it happens?” she asked Kaden.

“I thought you would know,” he said. “You’re the one who birthed it.”

Isa shuddered.

“*Are you afraid?*” Saavi asked.

“*No. Excited,*” Isa said.

As they entered the wormhole, data thickened the air and hummed with its own voice . Saavi’s sirphin tuned to it.

“The data are more than they seem,” Isa said, aloud. “They frame the empty spaces, where the information is the space itself.”

“Is that where the exotic matter is?”

“Yes,” Isa said. “We will add to it.”

“What will happen to our patterns? Who will be the presence, the Singer?”

“We gave our presence to the people. They will carry the Song. The song was, and is and will be. The song is Being itself.”

Again, the longing caught Saavi and shattered her into waves and particles. Where is Saavi? she asked. We are Saavi. We are Chava and all the sirphin. We are never less and always more.

The waves formed three ripples that fit like a groove worn before time began. The ripples expanded and brightened, merging like a bright star in Earth’s sky.

Collum and Rachel sat on the shore of Lake Superior. Bodhi slept in a swaddle of cloth at Rachel’s breast. The sky was a turquoise bowl studded with a few bright stars. A burst of light flared and then settled.

“Maybe that’s it,” Rachel said. “May that beautiful point of light is the wormhole.”

“Do you hear it?” Collum asked.

“It’s singing in my sirphin,” Rachel said.

# Postlude

**O**n this, the first day of Tishrei, Rosh Hashanah, we commemorate the renewal of life. Earth has completed another cycle around the sun since the wormhole was stabilized. Our kind has joined with the EpsIndi sirphin to restore balance to Earth's holobiome, in ways Chava's step-grandparents could never have imagined, with songs beyond the hearing of our many-times grandmothers.

CHASE's Captain Denzel Worth was one of the first people who recovered when the Singer allowed the healing to begin after Earth's leaders made an uneasy peace. The grayness receded and our cousins who eat decaying things have healed the great network that connects all us all.

The Singer says peace and healing will always take effort and sacrifice from the people of Earth and from EpsIndi. But the sirphin will help amplify the song.

Isaac Rosenberg and Ella Hayne Roca donated their paintings to the PanSystems Treaty Alliance to remind the world that the Singer was at work long before the EpsIndis arrived.

"Years ago, I thought I was painting my sister the way I saw her," Isaac said at the new treaty celebration. "I saw her through mystical eyes. She and I always talked to our angels, and we always knew God was not up in the sky. Our strength and Truth was not up there and out there, but deeply with us, profoundly integrated with our essence. Now I know I was not only painting her, but her descendants, and the symbionts that helped heal our world."

1 Tishrei, 5951

Sept 13, 2190

Consortium Homo Astra Space Exploration

Minnesota Point, New Ontario

Bodhi ai Hava Rohsen Bruce took his first steps on the beach of Lake Superior. Collum, whose face shined with sirphin, launched Bodhi back to Rachel. Rachel bent as far as her pregnant belly would allow, and caught the plump bundle of magenta and blue raised arms and splayed legs as Bodhi planted his feet for five steps, belly laughing, and fell into Rachel's embrace.