

IMPERFECT GODS

by C. Sanford Lowe & G. David Nordley

People must act on the best information they have. But what if there's no way to check it?

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Illustration by William R. Warren, Jr.

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Chapter 1

Spaceport, Planet New Antarctica,

Erebus System, 12 April 2272

She's on that ship, Naomi Abila thought as she watched the incoming interplanetary shuttle rise slowly in the far north like a supernova kicked loose from the firmament, a brilliant point of light that got higher and brighter every second. As it grew brighter and nearer, it began a majestic sweep eastward and inscribed a thin, glowing trace across Canis Major and then Orion. Gently, its path curved back until it was again headed directly for their base on New Antarctica.

Naomi smiled at her son, Sasha. She worried that he might resent having another person becoming, effectively, lead on New Antarctica's part of the project to create a mini black hole. That had been pretty much hers up to now. On the other hand, he idolized Dr. Brunhilda Kremer for solving the Quark star minimum mass problem, all the more since the story had arrived of how she helped derail an attempt to sabotage the project back in Sol's System. And, of course, in a time when age difference no longer mattered, Dr. Kremer was single.

The glow faded from blue-white to dull red to nothing. Flood beams stabbed up past the tiny yellow disk of their local giant planet, Amundsen, into the Milky Way and found their target, a tiny ball so reflective it might have been made of liquid mercury. Rapidly it descended toward them. At first it seemed like a small chromium moon, then, as it dropped lower, Naomi's perspective changed, and she saw the light scatter off a teardrop hull as big as a hill and shiny as a mirror.

A beam of brilliant green glowing plasma lanced up from the landing area and blossomed into a violet flower just beneath the broad part of the hull where its force spent itself against a silent expanse. Distant ice fields around their "dry island" city glowed in response.

The spacecraft slowed and followed the beam down toward the landing zone with the ponderous stateliness of objects of its scale. A hundred meters up, the

plasma flickered out and the two-hundred-meter-long teardrop settled down through wind-whipped snow as if held by some giant hand. The sight of a thousand tons of mass effortlessly floating on magnetic fields never failed to inspire awe in Naomi. At times like this her mind went back to ancient legends; we are heirs of Prometheus, she thought.

The port dome flowed around the ship as it slipped down into the colony docks.

Naomi turned to Sasha. "Let's go meet the new boss."

"Us?"

Naomi laughed. "Your Uncle Ted is out at the site and Wotan Kremer's tied up in a meeting about ice sheet slippage."

"Dr. Kremer is his daughter, isn't she? Hard to imagine Grandpa Abila staying away if it were you."

Indeed it would. Dad was always there to greet her when she came back from the construction site, even if only for a week. But Wotan Kremer was notorious for not letting personal matters interfere with business. "Yes, but melting planets has to be done just right. He'll probably see her tomorrow."

"I wonder what they'll call New Antarctica when they're done melting the ice."

Naomi sparkled. "Come on. You'll want to make a good impression."

He chuckled and followed her into the elevator.

She'd reserved a table on the upper level, where they could watch the disembarkation. She liked to watch the new arrivals and imagine who they might be and what their personalities would be like. Sasha shared that general interest, but today was a little more special.

They arrived in the great cylindrical cavern just as massive sections of the shuttle's hull swung aside, exposing its innards to the business of unloading. The hull was covered with frost and there was a sharp nippy smell to the air just mixed with the icy nitrogen above. They could even see their breath. Sasha tried blowing a ring of mist.

They walked to their table, a semicircle that curved away from the low, transparent guard wall. Four pod-chairs rimmed the table; they took the middle two. She settled into the infrared warmth of the chair and savored the sensation of breathing crisp air. They ordered coffee and watched four ramps slide out from the

sides of the cylinder into the ship. A host of robot unloaders rolled down three of them to get to the cargo. Above them was a large sign, “Welcome to New Antarctica. Erebus (Groombridge 34A) Star System.” The name they’d given the star was so new that someone had thought to add the old catalog name in parentheses.

A dozen folk emerged on the fourth ramp, hooded against the chill of the still warming air. “Do you know which one she is?” Sasha asked. “Mom?”

“Huh? Oh, sorry. I was just checking with the site on how impactor fabrication was doing. *Icestar* was reporting a concern about defect frequency.”

“Mom, those pop media gadflies would make a scandal out of someone’s hangnail.”

She chuckled. “It’s not really important; we’d like the impactor to be a single crystal, but that’s not a requirement. That close to light speed, its mechanical properties on impact are almost irrelevant.” In two New Antarctica years, their billion-ton iron rod would be the first to head toward the implosion site, a little less than eight light years away. Independently, identical impactors would be launched from Lacaille 9352, Epsilon Eridani, and Sol. Each impactor and each launch had to meet exacting specification and schedule constraints to make the implosion as symmetrical as physics would allow, or the biggest fiasco in human history would result. She was really not so unhappy to have someone else take responsibility for that.

A hood fell from one of the passengers, revealing a tall blond with wide-set eyes and a long nose. She didn’t seem to mind the chill, and she was grinning from ear to ear. She glanced around and Sasha’s eyes met hers momentarily.

“Mom?”

“It’s her! Dr. Kremer’s the tall one.” Naomi waved. The woman waved back and headed for the elevator.

“Not bad,” Sasha said. “She’ll melt someone’s icecap.”

Naomi smiled. “She looks really glad to be home.” At twenty, her son was somewhat of a man-child, brilliant enough in his architectural studies but never quite connecting socially. She worried that she was too close to him, that she hadn’t quite lived up to her weaning responsibilities.

Dr. Kremer reappeared on the terrace and headed for their table. She’d shed the hooded cape on the elevator, to reveal a trim figure in a standard gray unisuit. She carried herself with a grace that spoke of diligent exercise.

“Mom, is she an athlete?” Sasha asked. “Thirteen years on a starship and she looks like she could run a marathon!”

Naomi laughed. “About seven years ship time—remember your physics—and people have a lot of time for exercise on interstellar voyages. Sasha, don’t jump into the personal stuff right away, okay?”

“Okay.”

Kremer held out a hand as she reached the table. “Naomi Abila! How good to see you in person. And this must be Sasha!”

“Welcome to New Antarctica,” Sasha said, holding out his hand.

Kremer shook it, smiling broadly, then added, “I just heard everyone voted to change the star name to Erebus when I came out of deep sleep. I love the change—I think.”

Naomi patted her on the arm. “You’ll get used to it!”

“I got to visit its namesake, the volcano in old Antarctica.”

They sat and ordered more coffee, which a robot vendor brought in short order.

Sasha’s eyes glowed. “Earth must be amazing.”

“It’s good to be home,” Kremer said to Sasha. “You’ve just graduated, haven’t you? Architecture?”

Sasha nodded. “First year in grad school now, macroarchitecture.”

“He wants to design space colonies,” Naomi added.

Kremer smiled warmly at her friend’s son. “I’m sure he will. What do you think of the Black Hole Project, Sasha?”

“The BHP’s just mind-boggling, Dr. Kremer,” Sasha said, “trying to get such a precise collision with four-billion-ton impactors eight light years away.”

She laughed easily. “You can call me Hilda. And that’s about all there’s left to do in physics—mind-boggling things. All the easy stuff was done before we were born. We have to be precise, but not perfect. Vertex Station, where the impact point will be, provides the vernier beams and guidance points for the final approach. Then, on December 23, 2284, all four impactors meet the target as planned, and boom! We get a mini black hole.”

Sasha shuddered. “Or, boom! The universe blows up!”

Naomi grimaced and tried to think of something diplomatic to say as Kremer’s jaw dropped.

“Just kidding,” Sasha said quickly. “But we’ve got some ice-heads here, too, who think it’s possible.”

“Well!” Kremer shook her head. “I didn’t think I’d escape them entirely.”

“Anyway, we’ve got an extra six months,” Sasha said.

Naomi stared at him in surprise. “What do you mean by that?” No one had mentioned a delay to her. She looked at Hilda, who shook her head.

“I haven’t heard anything like that. Where did you get that, Sasha?”

“Ginny Wu at *Icestar* says a message came in delaying the impact time by six months. Says they’re reviewing the calculations and that Wotan asked them to hold it until he gets a chance to talk to you, Dr. Kremer.”

Naomi watched Kremer’s lips tighten for a brief moment.

“Ginny Wu is Sasha’s best friend’s cousin,” Naomi added. “It’s still a small town here.”

Kremer took a breath and smiled. “Well. You should have seen it when I was here. Morris Wu—he started *Icestar*—and I went to school together half a century ago. A delay doesn’t sound right, though; I should have gotten word directly. Let me double-check ... nothing.”

Naomi shook her head. “Dr. Kremer, uh, Hilda, it could be a rumor or a complete invention on someone’s part. Ginny can get a little in front of things at times.”

Sasha laughed. “Like when she said the Maluks were New Reformationists and they were just Baptists! It was weeks before all our Martian refugees started talking to them again, just for a rumor.”

“Well, I hope that’s all there is to this,” Hilda said. “You’ll let me know before doing anything about it?”

Naomi grinned. “Absolutely! When are you going to meet your father?”

Hilda shook her head. “He’s still in a meeting about tidal waves and the

planned Maud Plateau ice sheet collapse. Said he'd be here tomorrow. Naomi, I haven't heard anything about a delay, which is surpassingly strange. It's a major change. Brad Adams and Sarah Levine back at Sol's BHP would have sent messages to me. All the traffic I've gotten is completely normal."

"Including the impact date?" Naomi asked.

"That was set seventeen years ago," Hilda said. "The impactor state vector targets are cast in concrete; they're the fixed star about which everything else in the project revolves. The only reason to send a new one would be some major change."

Naomi shivered. "Hilda, we do have some Consolidationists here, including three of the ten planetary councilors. Hans Bluth, the security minister, is one of them. Wotan figured that was a good place for a conservative."

Hilda shook her head. "Some of those people think they're so right, that anything they do is justified."

Sasha's head was turning between them like a spectator watching a tennis match. "What happens if we launch late?" he asked.

Naomi looked at Hilda and both women shook their heads.

"Complete disaster," Hilda said finally, "of varying flavors, depending on how late and what is done about it, but as far as the project is concerned, complete disaster."

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Chapter 2

New Antarctica, 12 April 2772

Hilda found quarters in Hadley's Hotel, overlooking the large lake in the center of Dome 2, east of the spaceport. The hotel was a re-creation of the hotel in Hobart where Amundsen had stayed after his return from the South Pole. It was staffed by pleasant android robots with cockney accents. After brunch with Naomi and Sasha, she'd spent the day getting her things in storage and connecting with Shira Hassan, an old schoolgirl friend and BHP team member who promised to call on her.

Shira laughed. "I'll be the one in the head scarf and long dress."

"You always had the most beautiful long silk scarves." Hilda remembered them fondly.

Storage chores done, she took a break and walked around the lakeshore

where she and Mom had played. Still there was the fountain where Mom had told her of her decision to head the first expedition to Ross 128....

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“I have to do this, Hildy. Kyle Perot got himself killed in a skiing accident and they need another starship captain. It will be the first ever discovery voyage not mounted from the Solar System; and after sixteen years on my butt, it’s an opportunity I can’t pass up. You can come too, if you want.”

“Will Dad come?” she’d asked.

Mom had been silent for a while. “Your father and I ... well, sometimes two strong people need to get away from each other for a while.”

“Mom,” she had said, “I love Dad. All my friends are here. School—I’m playing clarinet in the band. Song-Do Chun wants me to go to the Waltz Festival with him.”

“I understand, dear,” she’d said with a smile. “Feathered and flown with projects of your own.”

“Huh?”

“Look up Millay. Don’t worry, dear, we’ll have more time together some day.”

“When are you going?”

“Tomorrow,” Kate Avonford had said. “Tomorrow.”

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Hilda remembered the moment as clearly as if it had been yesterday. It had been the end of her childhood. She finished the walk with moist eyes and headed up to her room, to bury herself in the details of expanding the solar power and beam projector array that would push Erebus’ impactor to its rendezvous some twelve years hence. She worked through dinner but made it down to the Lakeside Grill for supper with Sasha. The starship had been on New Antarctica’s thirty-eight-hour, four-meal day since deceleration, but she still felt a bit of a disconnect after all the years on Earth.

She watched a show until the wee hours, and fell asleep easily enough.

A crash of cutlery woke her the next morning. Her room overlooked a large courtyard full of diners busy with their breakfasts; someone must have knocked over

a cup. She opened her eyes and decided it was well past time to get up. Dad would be coming by at noon.

The knock on the door came at 19.6 hours, precisely. Heart in her throat, she opened it.

“Dad!”

Wotan Kremer had not changed physically since Hilda had last seen him, but he gave the appearance of a somewhat more youthful person than she’d remembered. His shoulders were more square, his posture better, his face more ruddy and self-assured.

Of course, the man who had sent her away to Earth at the age of sixteen had been a very sad person trying to put a failed marriage behind him. That had been six decades ago, with a reunion, two more children and another split. Those who are larger than life live by their own rules, Hilda thought. One looks up in wonder and tries to stay out from under their feet.

“Hildy!” He opened his arms and Hilda rushed into them. Sixty years of heartache were suddenly set aside and she was ten years old again, back in the time of birthdays, Christmas trees, and trips out to see the stars. Her eyes filled with tears as she laid her head on his broad shoulders. At length they parted. She rubbed her eyes. Should she mention Mom? What wounds would that open in both of them? Yet to say nothing was like trying to ignore an elephant in the room.

“Katherine sends her greetings from Luyten something or other, wherever she is now”

“I’m ... I’m glad you’re speaking to each other.”

“Hmmpf. Well, there are times when I think that the one year between messages is about right. But, *ja*, we communicate. I should have been more realistic; the only way one can keep a butterfly forever is to put a pin through it. Hildy,” he paused, “she’s very proud of what you’ve accomplished, as I am. The Ried clan and their allies were formidable adversaries, trying to sabotage your project! But you won’t have such worries now. Here, I am in charge!” He grinned at her.

They had *Mittagessen* of vegetable cake and salad, then talked into the afternoon about family, about Liz going to Lacaille 9352 to manage the final effort there, and Konrad, the brother she’d never met, leading the Colony at Ross 128. They wended their way back to Hilda’s room. Finally it was time to talk about the business here.

“Dad, there’s a rumor that Earth’s directed a delay.”

Wotan nodded gravely. “We received it five days ago. I wanted to talk to you about it before I released it.”

“I’m glad you did,” Hilda said. “Things don’t seem right—I would have gotten a message, too. From Zhau Tse Wen, from Brad, or from Sarah—from all of them.”

Wotan shrugged. “Our people had some reservations as well. But the orders came right from the BHP transmitter location—our interferometers pinned it down to within a couple of kilometers in the Sol System. The multi-channel signal was continuous, with all the right synchronization codes. There are occasional dropouts, but that happens going through an asteroid belt. I’ve released it to your access. Go ahead and take a look.”

She touched the local net and scanned the numbers. It was basically their standard state vector update, of which there had been several early on, but none in the last ten years. Standard except that the launch epoch was almost six earth months later. The comments field said the change was due to a recalculation of the ten sigma coupling to the probability field for fluctuation inflation.

Hilda’s stomach suddenly knotted up. “Dad, there’s no such thing as ‘coupling to the probability field for fluctuation inflation,’ and the BHP certainly hasn’t done any tests to look for anything like that.”

“Hmmm. Well, that’s not really my area, but I understand that many physicists think that the big bang couldn’t have happened by itself, that something external, some first cause, had to trigger the initial period of inflation.”

Hilda was about to say she’d never heard of such nonsense when she remembered that she had, and where. “Dad, there was a Dr. Hiram Kokos working with the Consolidationists ... I think he was making those kinds of noises. He’s a planetary astronomer, not a theoretical physicist, and no real physicist takes his stuff seriously. Ask your local physics community.”

Wotan shook his head. “Hildy, that would be Brian Lobov, who runs the physics department at our university, and maybe a couple of others who make it a hobby. He’s pretty good; I rely on him.” He smiled and shrugged. “But there is just not much of a physics community on New Antarctica, even now. We only have about half a million people in the whole system! Why do you think I sent you to Earth?”

Hilda’s eyes opened wide.

“Mom left. I thought I was, well, in the way. A reminder.”

“Oh, no, Hildy, never that! It was for your physics. You didn’t want to do

anything else—no boys, no dances, just your equations and your experiments. Hildy, do you remember the argument you had with Alex Leparc about relativity? I thought you two would come to blows! You were, what, eight years old?”

Hilda winced. They *had* come to blows, later, and nobody had ever heard about it because young men don't like losing fights with girls.

“For physics, Hildy, you had to go to Earth. All these years, you never said...”

He was completely right, she realized. She could never have done what she did at New Antarctica. But she had not felt that way at the time. Emotions held back for years raced through her. She didn't know what to say.

“I'm sorry, Dad. I just ... Should I order some drinks?”

Wotan sighed and smiled. “Dry sherry. Our vines have done well.”

She placed the order on her bionet. Wotan kept talking.

“Have you noticed that the glaciers are starting to retreat? Air pressure went over 0.6 bars a couple of months ago, and our mean surface temperature is up to 254, and up to 274 within fifteen degrees of the equator. Things should proceed quite rapidly now.”

Hilda's mind shifted gears. “274? Above freezing? Open water? Do you have open water?” New Antarctica had started with a surface temperature of 233 K at the equator, with spots below 173 K at the poles.

Wotan laughed—the deep-throated, powerful, thunderous laugh she remembered from the good times of her childhood. “Not yet, but they've created a betting pool. The bets will peak for a time a few months from now. People keep asking me; I tell them I'm not saying because I don't want to bias the pool. Can you imagine that? It is far too complicated to predict precisely, but they think I know and am not saying!”

Hilda shook her head.

“This is the most Earthlike planet humanity has ever found! Mass, gravity, tectonics, everything. All we had to do was give it a little push, *ja!*”

Their drinks arrived. Wotan swished the dark fluid around his mouth, then abruptly swallowed.

“You must come on an air trip with me and I will show you this world I am building for you.”

“For me?”

“Of course for you, if you want it. Why do parents do anything?”

Hilda laughed. No person could own a planet, but as a first-generation founder’s daughter, and having made a small mark in human history, she would occupy a unique position here for as long as she wanted. “Okay, but it will have to be tomorrow; I’ll be leaving for the site the next day.”

Wotan drained what remained of his sherry.

“Done. We’ll leave about eight, from West Dome Airport.”

After Wotan left, Hilda remembered that they’d left the conversation about the delay unfinished. She touched the net to find Dr. Brian Lobov.

Somewhere, the fates were having fun with her. Dr. Lobov had been a student of none other than Hiram Kokos. Whoever had sent that message had sent it to fertile ground.

The next day, they left early and flew over the ice pack and emerging islands of New Antarctica’s Great Equatorial Sea. Their aircraft was a high-wing delta design with a mostly transparent fuselage. Wotan flew with manual controls. He was born before genetically engineered bioradio and had an irritable distaste for prostheses. As long as Hilda could remember, he preferred to do things with his hands.

Wotan pointed out to her where the first open-air settlements would be. “It’s a volcanic island chain, with the hot spot migrating southeast, somewhat like the Hawaiian Islands, but a bit larger. You see, the big caldera, Novetna, is now free of ice!”

At his touch the aircraft banked left over the gigantic sharp-edged depression on the top of the mountain. They were cruising at fifteen kilometers above sea level, but the mountain was almost twelve kilometers, and a red-orange glow from a spot in the huge caldera was easily visible.

“It has a lava lake!” Hilda exclaimed.

“*Ja*, more than one. We will not build too permanently near that one! The next island west is not so active. The government and the university, they will go there. I call it Avonford Island, after your mother.”

“You miss her sometimes?”

“I miss the good times. But, Hildy, you must remember she and I are two stubborn people who found we could not make always the compromises two people must make to live together. We both had to be in charge, and that was impossible. Impossible. The fights, those I do not miss.”

Together, they watched the icefields flow by below in silence. Hilda brought up the subject again.

“Dad, the university...”

“There will be a place for you there, Hildy, if you want it. Dr. Lobov will be glad to have you; he has many new ideas he would like to discuss with you.”

“Uh, Dad. I’ve looked at a couple of his papers. You don’t have much in the way of peer review out here, and...”

Wotan held up a hand, with a laugh. “Hildy, I cannot get into any physics discussions—not my area—but I am sure that is something you physicists will work out! Perhaps the experiments done with this black hole we are making will clarify things, no?”

Hilda nodded, with the unspoken reservation that some people find it very hard to give up cherished ideas, even with contrary data staring them in the face.

“Dad, I’m convinced there’s something wrong with the delay message. The physics justifying it is wrong, but it’s wrong in such a way that may not be clear to Dr. Lobov.”

“He is a good man, Hildy. You are suggesting that someone has deliberately sent a false message to sabotage the project?”

“I think so. There’s been no subsequent confirmation.”

“Hmmm. Hildy, would there be?”

“It’s such a major change, I’m sure I would have gotten a personal message from Tse Wen, Sarah, or Brad. The physics is such a departure from the standard model that it would be the most important thing happening in physics. But we have no news.”

Wotan was silent for a while, then said, “If we send our impactor at the wrong time, it would be bad.”

“Very bad.”

“I am looking forward to using mini black holes to make a new kind of world,

like a ring world, but one that can use the energy conversion properties of a black hole to provide light and propel itself among the stars, or maybe even to another galaxy.”

“Dad, that would take millions of years.”

Wotan laughed. “When I was growing up, people got old and died in a few decades; everyone was in a hurry. ‘We aren’t getting any younger, are we?’ they would say about delays. Now we say ‘we aren’t getting any older, are we?’ There is time enough.” He reached out and touched her hand. “Hildy, people look up to me here. I have to be responsible and responsive.”

He chuckled as if he did not take it very seriously, but Hilda saw the steel in his eyes and thought otherwise.

“I do very much want the black hole to be created,” Wotan continued, “and it is a unique honor to be chairman of the Erebus System Commonwealth Council when it is happening. But that means I am not free to do exactly as I please, even where you are concerned, my Hildy.”

“Dad, if our impactor is late, and the other impactors aren’t diverted, they will make a beam of relativistic matter and radiation that could squirt out our way, spraying over this planetary system. Everyone will have to take shelter. Some of the larger pieces of debris could hit like nuclear warheads. It would be moving so fast that the first of it would arrive only hours after the flash of the explosion. Very little warning would be possible.”

Wotan thought for a while. “There is time,” he said finally. “The Impactor does not launch for eighteen months yet, even on the old schedule. So no changes need to be made now. We will discuss and evaluate this. Meanwhile, I have something to show you. Ahead, we approach the shadow line.”

Their aircraft had overrun morning, racing into night. As the sky darkened, Hilda saw the Vasili range rise before them, painted blood red by the rising star behind them.

“Oh!”

“*Ja*, but wait a moment now as we go over.”

Darkness fell and Hilda soon found the next planet out, Wilkes, rising over the peaks. Almost as bright as Venus from Earth, it was easy to spot over the mountaintops in the crystal clear sky.

“That one is near opposition. A pretty sight. But look down.”

The ice below glowed red as far as she could see, as if lit from beneath. A network of brilliant yellow lines could be seen here and there.

“You have heard of the Deccan Traps of India?” Wotan asked.

“The huge lava field?”

He nodded. “Something like that is happening here, beneath the ice. We have removed an immense weight from the local geology. New Antarctica is smaller, denser, and younger than Earth and the demons of its core are less tame.” He chuckled at the metaphor. “We have loosed their chains, and this ice is now melting from both below and above. It will be gone here in a few weeks, I think.”

“And with it the clear skies,” Hilda remarked.

“*Ja*, for a while, cloudy it will be.”

A meteor streaked through the dark sky, and then another. Soon the sky was full of them.

“More nitrogen,” Wotan said, “that was once ammonia ice in the Krietzerbelt.”

The planet was transforming before her eyes. How many years would she live, Hilda thought, how many star systems might she see, before she saw the likes of this again!

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Hilda caught her breath as she approached the nearly completed impactor with staff members Phil Stavros, Shira Hassan, Naomi Abila, and her brother Ted Abila. From ten kilometers out, it looked like an incredibly long, thin beam of light with a spiderweb at one end.

“How did it go with your dad?” Naomi asked Hilda as they approached its dull gray cylindrical surface.

“I was awed by the progress he’s made,” she answered softly, thinking about progress in all its various guises.

“What about the project schedule?” Phil Stavros asked, swiveling his seat around. He was nominally their pilot, but he handled everything through AIs and the net. A youngster of forty, he’d mastered the ability to carry on a verbal conversation while interfacing visually with the net.

“We can keep going for now, but he’s not convinced the message is phony.

The physics rationale is apparently credible to Dr. Lobov, whom he trusts.”

“But Lobov doesn’t have...” Naomi paused and started again. “He’s a nice avuncular showman and students love him, but I know physics better than he does!”

“I know, Naomi. But Lobov has a Ph.D. from Earth. That makes him a god as far as Dad is concerned.”

Ted shook his head. “A rather imperfect god, if you ask me. I have an idea.”

“Yes?”

“We can add another deflector ring to the design. It will let us push 50 percent harder and give the control system 50 percent more drag to use when it reaches the vertex. We may need some added flexibility—in case there are schedule problems.”

Hilda thought long and hard. There was only one thing more important than not getting into a contest of wills with her father, and that was the BHP itself. She closed her eyes. If Wotan were held responsible for the failure of the BHP, his reputation would be ruined forever. Humanity had not yet gotten used to the implications of that word “forever.” The ancient words came to her mind: *Cattle die, kinsmen die, a man himself must likewise die, but one thing lasts forever, the doom on each man’s life.* Nowadays, one could not even count on death for escape from one’s critics. It would be up to her to keep her father from becoming the laughingstock and fool of history.

But even fighting for his own doom, Wotan Kremer could be a formidable opponent. And he was the law, here. Hilda touched Naomi’s hand. “We need more of a contingency, and one that is less obviously a challenge to his authority.”

“What did you have in mind?”

Hilda shook her head. She tried to remember what she could about leadership. An American general, Patton, had once said something like, *Don’t tell people how to do something, tell them what you want done and they will surprise you with their ingenuity.* That seemed to fit the circumstance.

“It’s probably best that I don’t know,” Hilda went on. “Dad can be very clever, and I don’t think I could lie if he asked me a direct question. Meanwhile, Ted, I need a favor. You’re more attuned to AIs and what they can and can’t be made to do.”

He nodded, looking at her with dark shiny eyes from beneath a mop of short, wavy black hair. He was, she thought, very handsome.

“What do you want me to do?” he asked.

“I’ve sent you a link to the postponement message. I’d like you to analyze it front and back. See if you can find anything suspicious at all that might indicate a fake—besides the content, of course.”

“You mean like using a different version of the spread-spectrum encoding protocol?”

“The what?” Hilda touched the net and was greeted by a two-line definition, half the words of which she didn’t know, and a menu of menus, the titles of which would require a trip to a dictionary. She shivered. Just as soon as you think you’re hell on wheels in this universe, something comes along to humble you.

“Uh, a spread spectrum protocol is something that determines which bits go where on which frequency,” Ted said. “Different protocols work better than others, depending on what part of the solar system the beam is going through and what the solar activity is—separate AIs might differ on what protocol to use, so an abrupt change in protocol could indicate a different choice, or just a change in conditions. But it could be an indicator of a different source.”

“Yeah, that kind of thing,” Hilda said. “Indicators. Lots of good, solid indicators.”

A slight tug on their seat harnesses told them the runabout had reached the end of the impactor. The lines holding the superconducting loops that would pull the impactor up to a gamma of ten looked exceedingly thin, but up close, Hilda could see they were more complex.

“The stays are like lace tubes.”

“Yup,” said Ted, “almost two meters across. The lacy pattern is due to cross-connections—you could cut any of these stays in a thousand different places, and still tow the impactor. The carbon nanotubes that bear the weight are even thinner. Most of what you see is matrix and shielding. The Groombridge 34 system is fairly young still, 2.734 gigayears by the last measurements, and there’s a fair amount of debris around. So we have to design for more contingencies. By the way, have you looked at Bee?”

“Bee?”

“Our other red dwarf. Out that way.” Ted waved toward the rear of the impactor.

Hilda followed the motion of his arm and soon spotted a very brilliant orange-ish star.

“Pull up a visual from astroview and zoom in,” he told her.

Hilda did so.

“It’s only about a tenth the brightness of A,” Ted said. “Not much more than a brown dwarf, and the biggest thing in its planetary system is a micro-giant with a Mars-sized core, about three Earth masses of ice on top of that, and two Earth masses of hydrogen, etcetera, on top of that. But it’s got a huge asteroid belt—almost a ring system, really—about two tenths of an AU out.”

Hilda noticed a dark curved line across the southern hemisphere. “That thick dark band?”

“Yup. The first planet out is a bit off the equatorial plane—probably an escaped moon, an interloper. Anyway, it makes the ring thicker than it would be otherwise.”

“Anyone out there now?”

“Less than a hundred researchers and the usual infrastructure,” Naomi said. “The main habitat is a toroid—only three hundred meters across.” She grinned. “It contains the smallest population of any inhabited star system that we know of. My other brother’s out there and says they’re lost in it. It’s a good place for independent minds that want to get away from it all.”

Hilda thought about the opportunity such seclusion would give her. Time to think. Time to wrestle with the universe without having to worry about projects, schedules, and politics.

“You look wistful,” Ted said, laughing. “Are we already such a pain?”

She shook her head. “No, no. It’s just that, well, not everyone is made for what they have to do in life.” She sighed.

Their craft rounded the impactor in silence.

“I may have to oppose Dad to make the project happen,” Hilda finally said. “I’ll need your support and it won’t be without risk. Tolerating disobedience isn’t one of Dad’s virtues; he can be gentle, but only when his control isn’t threatened.”

“Wotan’s our elected leader,” Naomi said. “You can’t just say no, Hilda. You have to think about the rest of the colony and your responsibility to them!”

“Oh, God, Naomi! I’ve thought of nothing else. But that’s the point, isn’t it? That message is bogus. If we follow it, we’ll have had a role in sabotaging the most important project humanity has ever attempted. It passes all the authentication tests;

but Tse Wen and all would never send out something like that without a viable explanation.”

“I can’t remember any group, never mind an individual, openly defying the Council president before,” Ted said in a hushed voice.

Shira Hassan spoke up. “We made him give in on allowing traditional clothing.”

Hilda nodded. If it had been up to Wotan, there would probably have been a dress code. As it was, the colony colorfully reflected the varied national origins of its people. Her father was stubborn and autocratic, but not impossible when others were clearly in the right.

“He may not feel free to do what he suspects should be done,” Hilda said. “You would be saving his name and his reputation as well, though don’t expect to be thanked for it.”

“Well,” Ted said, “it hasn’t come to all that yet, and we’ll proceed as if this delay order is going to go away. I’ve got a feast programmed back at the construction shack. Strap in!”

Hilda laughed and had barely gotten her belt around herself when the runabout leapt forward at what must have been a full gee. The construction shack, a golden ring spinning on top of what looked for all the world like a beehive of robots, grew before them. Now that she thought about it, she was hungry.

Most of the crew were there to meet her, and over coffee after lunch, she laid it out for them. A younger woman laughed nervously. “We’re just going to buy some time, right, Dr. Kremer? Until something from project HQ clears this up. That’s not defiance; I mean we wouldn’t really be doing anything irreversible. It’s not any worse than, say, pretending you’re out of touch when someone rings you. Once it gets cleared up, we say, ‘Oh, sorry, there must have been some miscommunication,’ and because shutting down would have been a disaster, they wouldn’t look any deeper than that.”

Hilda shook her head. “That impactor has to be on its proper vector come whatever, or the project may be dead for a long, long time. The Consolidationists are within a razor’s edge of a majority back in the Solar System. We may never get another chance.”

One of the older researchers raised a hand. Hilda nodded.

“Jake Jabowsky, Dr. Kremer. What if we’re all wrong? What if we send our impactor into that asteroid against legitimate orders? What then? Our collective butts will all be *persona non grata* here from now to kingdom come!”

“Cool it, Jabowsky,” Phil Stavros said. “That would be nothing compared to what would happen if we’re not wrong and *don’t* send an impactor!”

Hilda shook her head. “We’re not wrong, and I’ll be available here for the next ten days to walk anyone interested through the physics. But that’s a good point about the consequences. I know we all believe in this project. We wouldn’t be here if we didn’t believe in it. But those of you who don’t think you can survive the consequences should leave now before you are further involved. I hope I can trust you enough to not talk about our intent prematurely.” Hilda looked at each of her team members in turn. And then she looked at them again. “Who’s with me?”

Jake grabbed his jacket and headed for the exit. He might be a useful witness when this is all over, she thought ruefully. No one else left.

Ted raised his coffee cup. “To launching on time, come honor or chaos.”

“To launch!” a dozen voices cried, and they all clinked their coffee cups together.

“Looks like we’re in with you, Hilda,” Ted declared.

Hilda allowed a few nanoseconds for relief to drain tension from her shoulders. Then she smiled at her team. “Let’s get back to work then, and be thinking about how we’ll do this.”

* * * *

Weeks full of quiet tension became months of quiet tension. Finally, just to ease the stress, she agreed to go swimming with Sasha in the dome’s center lake where she had swum as a child. Too late, she realized that swimsuits were forty years out of style here. She looked studiously straight ahead as she walked naked into the icy water and quickly submerged her body up to her neck. *It couldn’t have been this cold when I was a kid*, she thought, between ragged gasps. Finally, she got used to the temperature and began to relax.

“Something’s bothering you,” Sasha said, swimming over next to Hilda. “Something more than cradle robbing, I hope?”

His young impetuosity made her laugh. It was much needed. “Cradle robbing? If you were sixty-five and I were twenty, would that be cradle robbing?”

“I guess so. It’s okay as long as it’s fun, I think. I mean, we’ll live forever, and if I were a million and eighteen and you were a million and sixty-five it wouldn’t make much difference.”

Hilda laughed. “It’s hard to imagine what we’ll think when we’re a million years old.”

“Are you cold? Do you want to warm up on the sand?” Sasha asked. He began to lead the way toward the shore.

She shook her head and glided back away from the shore. Sasha joined her. He took one of her hands and rubbed it as if warming it. The floor of the lake had fallen away and they were treading water.

He turned his body and brushed himself against her. “I can warm you up a bit more. Doing it with people watching slides easy, here.” He took her other hand and rubbed it. “Uh, you don’t mind do you?” he asked.

She didn’t mind it, she realized, any more than she needed it. Her mind was far elsewhere, fragmented in time and space. She was in her room, three quarters of a century ago, simulating solar systems while other kids went swimming. She was watching the data come in from the black hole they were making, a dozen years from now. She was skimming over endless fields of solar arrays last week, drinking in the power to make it. She was listening, then and now, to her father telling her to pay attention to other people’s ideas and not act as if she knew everything. She was with Brad in Lillehammer, a long time ago and now with this urgent young man beside her whose attentions she did not, in some existential sense, mind at all; they just were. Her whole life was of one cloth.

His hand caressed her cool skin and she didn’t mind.

But she had better pretend she *did* mind, or things could slide down the slippery slope of major embarrassment. She pushed him back and laughed. “Give me another year or two to get used to the idea. Meanwhile, the impactor launch will be excitement enough.”

Sasha’s eyes went wide. “The old man give the okay?”

Hilda shook her head. “I’m going to talk to Lobov and see if I can convince him to help us persuade Dad.”

“Terry’s in Lobov’s class—thinks his ice is clear.”

“Which means?” The metaphor didn’t ring a bell with Hilda; as familiar as the colony on New Antarctica was, it was different, too. Her mother had never been topless in public, that she knew of, let alone totally naked. But there was not one swimsuit in sight. She’d been away.

“He can see all the way to the bottom of things—real deep.”

“And Terry is?” Always check the quality of the data...

“One of Jennreh Poi’s cocks,” Sasha said, as if that explained something.

“Students?” Hilda asked.

“Huh? Oh sure. Terry’s a grinder. He’s talking about going back to Earth to study under Dr. Kokos. The First Causes guy.”

Despite the warm male body next to her, Hilda shivered. “Sasha, I don’t think it’s a good idea to mix religion and physics, but it’s even worse to mix them and not be honest about what you are doing. This Jennreh ... is she a lover of yours?”

“No such luck. She’s an artist, Kama Sutra and all.”

Hilda looked at him. “I didn’t really mean to pry. Everything is so much more open than before. It’s just not a big part of my life.”

“Sex?” He looked incredulous.

“That. Not a big part of my life.”

Hilda felt his hand leave her skin. “Damn, why had she said that” was written all over his face. “Look,” she said, “Jennreh and Terry, do they talk about Lobov? What he says in class?”

Sasha pulled back to the moment. “Some. Uh, they are into something they call ‘intuitional science.’”

Hilda looked at him with a raised eyebrow.

“It’s the idea that the broad sweep of things must first make sense at some higher intuitive level so that if you’re really in tune you can just, uh, *understand* the fundamentals of what’s going on and the details, equations, and math aren’t really as important. Dr. Lobov kind of smiles at that and makes them work quantitative problems anyway. But Terry says Dr. Lobov has a lot of questions about the assumptions behind things, like he’s not sure the standard model is right.”

“Anything about the BHP?”

“Terry said Lobov said the BHP isn’t necessary for science unless it shows the theory is wrong. But if it can show the theory was wrong, it shouldn’t be done because it would be unsafe. Uh, that’s kind of complex.” Sasha sighed and frowned. “If you want to talk to Terry, I guess I could set that up. But watch out for his come-on.”

Hilda looked into Sasha's brown, pleading puppy eyes and placed a quick kiss on his cheek. She sighed. "There's not much time, so I'm going to have to go with what I've got. Thanks for giving me an idea of, uh, how clear Lobov's ice is."

Sasha smiled. "That's okay." He hesitated, but only for a moment. "Uh, do you want me? Even a little bit? Or am I acting like a complete idiot?"

Hilda laughed. "What would your mother think?"

Sasha rolled his eyes. "I think she'd be relieved. She keeps trying to fix me up and it keeps not working."

"Oh? Why is that?" Hilda instantly berated herself for teasing. She needed Naomi's goodwill, and her guess was the mother doted on the son.

"I guess I don't have the timing right. Like with you now. Or like when a girl wants to do stuff, maybe, and I keep talking. That kind of stuff."

Hilda put an arm around him and kissed him again on the cheek. *Why not*, she thought. *It would be an act of grace*, she smiled to herself and reached her fingers out as if to touch Sasha one more time. She stopped herself and let the water cool her down. *First things first*, she told herself.

"Can you meet me tonight? After my meeting with Lobov?"

"You ... Really?"

"Really! In my room in Hadley's Hotel. About 3130?"

"Yeah. Sure. I mean if you really..."

Hilda put a finger on his lips, then, with as much dignity as she could muster, stood up and walked to her towel on the beach.

* * * *

Dr. Lobov was disarmingly friendly and ebullient as he ushered her into his simply furnished, open office area overlooking Dome 4's central park. He was tall, with wide shoulders and deep blue eyes. Hilda noted he wore a jet-black jumpsuit, unrelieved except for a polished silver cross within a circle, decorating his belt buckle.

It might, Hilda thought, be an Earth symbol, or a Christian symbol, or just a design.

"Wotan tells me you might consider joining our faculty!"

Hilda smiled. Young people moved in and out of the area freely, except for a serious young man with a dark goatee sitting in a lounge chair in a corner, staring off into space. Having been there, Hilda knew he was likely working his virtual rear end off in some simulation that only he could see.

“I haven’t taught in years, but as long as I’m here…” She shrugged.

“We’ll have thirty-two incoming major students next year. We really should have two introductory sessions. You know how we do it here?”

Hilda shook her head.

“The whole class meets once a week and just talks about concepts and ideas.” Lobov waved an arm in the air. “The programs take the students through at their own pace, and alert us if someone is having trouble. Then we have appointments to help them through.”

Hilda nodded. “I did my undergraduate work on a starship that way. The captain helped me at first, but I’m afraid I got ahead of him a bit. I took my degree exam after deceleration, did my senior orals, and graduated the first week I was on the Farm.”

“The Farm?”

“Stanford.”

Lobov smiled and shook his head. “Well, it certainly seems to work okay. But here, we mentor.”

“I’m sure it helps, and I do look forward to talking with students again. I haven’t had any experience with undergraduates, though…”

“You’ll love it! Fresh minds ready to be shown the way!”

Hilda laughed, then brought up what she came for. “Dr. Lobov, I need your help. Are you aware of the political problems the Black Hole Project has had on Earth?”

Lobov frowned immediately and nodded gravely. “Not everyone here feels we are ready for it, either.”

She gave him a wry smile. “I’m very sure that the delay message was a covert product of the opposition and does not reflect the views of the leadership of the BHP, nor the position of the government. I need to convince Father of that. I know you think highly of Dr. Kokos, and the reason given for the delay seems to follow

from his work.”

He nodded. “Yes, so it seems. But I think there is a ‘but’ to this, no?” He flashed a quick smile.

Hilda sighed. “If we look at Kokos’s paper with Sun and Kreshkov in 2102, the threshold they calculate for what they call a ‘seeded inflationary fluctuation’ is three orders of magnitude higher than what the BHP can generate. So this isn’t really consistent with Kokos, either. I’ve put the work up under my name and Kokos’s. I’d like you to take a look at it.”

He frowned more deeply and waved at his wall screen, which promptly displayed the equations. He studied them, nodding, then shook his head. “When we are so close to the cutting edge of what we know, maybe three orders of magnitude is not so much.” He rubbed his chin slowly. “I will have to look at this more carefully. It has, you will appreciate, been some time...”

Any undergraduate at Stanford, Hilda thought, would have had no trouble with what she had given him. Trouble was, she needed this man’s help. She deftly disguised her shock with a smile.

“Of course, Dr. Lobov.”

He nodded. “There may be something to it, but what your people back in the Solar System...” He raised a hand. “Peace. I acknowledge that you think the change did not come from your people. But the argument itself *is* in the scope of the broad, intuitional thrust of Kokos’s work, the modeling details...”

Hilda could contain herself no longer. “Dr. Lobov, that’s a fourth power in the denominator! To reduce the triggering threshold by three orders of magnitude, the Johanssen quintessence multiplier field would have to be *twelve* orders of magnitude higher!” Not that there was any evidence for any such “quintessence multiplier field” in the first place. She bit her tongue on that because it was one of Dr. Kokos’s pet hypotheses. One did not win a physicist’s support by attacking the pet hypotheses of his mentor.

“Do we know that it is not?”

“I think we do. A QMF that high would produce billions of little universes at every gamma ray burst! That clearly doesn’t happen!”

Lobov shook his head. “I’m not sure ... I ... I’m just not sure.” He smiled weakly. “Perhaps, you ... we ... are missing something obvious. QMF seeding is such an elegant, clear solution to the first-cause problem that it *feels* right.”

“But I’m not asking you to give up QMF, just to recognize that, quantitatively,

it can't apply to the BHP."

Lobov sighed. "I'll have to study it more. You do raise some interesting points."

"Will you say that much to Father?"

He shrugged and grinned. "That would not be so much backtracking for me. I have never claimed certainty about the universe-seeding concern, only that it was defensible in light of the first-cause principles—qualitatively, of course. Well, now!" He brightened as if a storm cloud had passed. "Can I at least talk you into a seminar series next year? On the famous Kremer's limit?"

By that time, she realized, the impactor would be launched and the last pusher pellets en route to it. Suddenly, she appreciated that her role in the Black Hole Project would be over. She would be just one of many investigators at the end of a fire hose of data—most of which would be of more interest to engineers and relativicists than someone whose specialty was ultradense matter.

She was home. She had a new life ahead of her. It was time to start thinking of that.

"Of course," she said. "Let's talk about the schedule after you've got your new class settled in."

Lobov laughed. "Speaking of which, the day has moved on a bit, hasn't it?"

Hilda smiled and nodded as she rose. It was approaching 3000. The student with the beard was still sitting in the chair as she left. As she turned to wave from the door, her eye happened to fall on an old-fashioned 2D image hanging in a frame on Lobov's wall. She turned quickly and walked away so Lobov would not see the shock on her face. It had to be fifty years old, at least. Lobov had been on New Antarctica for some thirty-eight years. A lot of time for things to change by some standards, less by others.

The picture was of Lobov with two men and a woman in a residence, probably on Earth—Earth, because the other people in the picture were Torsten Ried and his older brother Lars, leader of the anti-BHP Consolidationist Alliance.

* * * *

Hilda wasted no time leaving the building. Once outside, she called Wotan, then rushed toward his place in Dome 3. Short dim-red lights illuminated the darkened evening pathways. Brilliant stars of the Southern Cross and Eta Carina overhead provided enough light to make out the various features of the landscape. Someone briefly opened a door across the lake from her and the brilliance of that

little bit of artificial light hurt her eyes. She blinked hard and saw the reflection of Scorpius on the still lake, remembering that, as a child, she had imagined it a sea monster about to emerge and devour her. The air was crisp; New Antarticans had always enjoyed a vigorous diurnal temperature change. Alas, this was no time for her to tarry, with two appointments yet for the long local evening.

As she neared the passageway connecting Dome 2 with Dome 3, she heard footsteps behind her and turned. A dark, unrecognizable shadow was right behind her.

“Dr. Kremer,” the person said. It was a man, by his voice—a cold, flat, unwavering voice.

“Yes? Who are you?”

“I am a warning. The impactor launch will be delayed. The message will be obeyed.”

Suddenly, the night seemed chillier.

“The message is a fraud,” she said. Quickly she touched the net and asked it to record what she heard and saw.

“We are not concerned with who the message comes from, only that it is obeyed, and that you do nothing to subvert your father’s direction that it be obeyed.”

“He hasn’t given that direction.”

The figure began walking away. It was real enough. She could hear the crunch of sand under his feet. No, that could be faked, if needed. Should she chase it? Run in the other direction? Or keep her composure as if nothing had happened? She decided on the last, and began walking briskly to Wotan’s home. On the way, she queried the net and found that the voice was untraceable. What was she dealing with?

Wotan had a glass of wine waiting for her and was not in the mood to talk about the BHP. Rather, he talked about the growing colony and how, in a few decades, people would walk around on New Antarctica in shirtsleeves, and the only ice would be near the poles or on the tops of mountains.

“Then,” he mused, “maybe I will move to Bee and start all over again. I will have to build a whole planet there, do you know? It will not be a big one—maybe the size of Luna. If they let me, that is.”

“But you’re...”

“I’m not in charge there. It is a separate star, no? There are only a few people living there, but they decide their own things. Maybe they will surprise me! They are building their own starport—did you know?”

Hilda shook her head.

Wotan laughed. “It will be a long time before a starship stops there that does not come here first, but it is a symbol for them. Everyone gets to dream, no?”

“Father, we need to talk about the Black Hole Project schedule.”

Wotan frowned.

“If we do not launch our impactor on schedule...”

“I am all for launching the impactor on schedule. The question is whose schedule? Yours, or the one the project sent you?”

“They didn’t send that.”

“Hildy, who else would have?”

“The Consolidationists. Lars Ried and his crew. Lobov knows them—he has a picture of the Ried brothers hanging up in his office.”

Wotan shook his head again. “Now we have conspiracy theories!”

“Backed by the fact that the message cites physics that are wrong.”

Wotan kept shaking his head. “I have only your opinion for that, against that of every other physicist in the system.”

She couldn’t believe what she was hearing. “Have you polled them? How many have you talked to?”

Wotan’s face clouded as if he were going to yell at her the way he had when she’d been late for family outings or forgotten her housekeeping chores. Surprisingly, he said nothing, and his features softened.

“I forget sometimes that you are not who you were, Hildy. You have been around the block some and have a right to your thoughts. Please remember, however, I have been around much more than you, and I must make the decision. Absent any proof other than what only physicists can quarrel about, I have to take the message as valid. If I were to do otherwise...” He shook his head. “There are people here who think I have been leader too long. What I do must be

understandable, or I lose the support.”

Hilda saw her dream begin to crumble before her eyes, all because of this stubborn old man who could not see, who would not think.

No, that wasn't fair. She was the only one who knew, the only one in the whole damn planetary system who *knew*. For everyone else, it was politics, dueling experts, and belief. Very well, what political argument could she make?

“Father, you know that verse from the Havalmaal? *Cattle die, kinsmen die, so oneself must likewise die...*”

“...but what dies not is what is said, the doom that lies on each man's head,” Wotan finished.

“If you are the cause of the BHP failing, what will history have to say about you, down through eternity?”

“Not good, I grant, if you continue to oppose me, Hildy. If we are both wrong together, then neither of us will hurt too badly. If we both insist on being right in opposite ways, then only one of us will be right, and the other will suffer.”

“There is time yet.”

“*Ja*, there is time. Do you know there is enough open water now that plankton may survive? Maybe next month we will seed the equatorial sea!”

So, Hilda thought, wryly. When it gets uncomfortable, Wotan changes the subject. They still had not had a good talk about her mother.

* * * *

Hilda reached the door of her room feeling drained, betrayed, hopeless, and on the verge of tears. As the nineteenth-century style door swung open, she saw Sasha was waiting for her in a T-shirt and running shorts. “Sasha! How...”

“It's a small town, Dr. uh, Hilda. The desk clerk is Holly Wu's aunt. She let me in. Uh, if this is a bad time...”

They had a date. A million years ago, she'd made a date with him for 3130 and it was almost 3200.

“Looks like you had a bad meeting,” Sasha said, worry written on his face.

Hilda smiled wryly. “It did not go well, but we're still alive for the time being. Why? Do I look like I just got out of a three-gee simulator?”

“You’re kind of drooping a bit. Could you use a hug?”

He stepped forward and opened his arms. Without really thinking, she did the same and met him halfway.

The door swung shut behind her on its own—only the appearances of Hadley’s Hotel were early twentieth century.

* * * *

Chapter 3

New Antarctica, 23 October 2273

Over the following year, a few brave pioneers had moved to the equatorial islands as spectacular icebergs fell into the newly open seas of New Antarctica. Hardy plankton had begun to grow there, and Wotan was predicting fish within a decade.

Meanwhile, impactor launch preparations were coming to a head, but Hilda still had nothing other than physics and faith in her colleagues that they would prove the delay message was, indeed, fake. The camaraderie she enjoyed with her father had become strained; the elephant in the room was now a dinosaur. If either of them mentioned it, they argued.

Meanwhile, Sasha continued to ask Hilda for dates. Her status as Wotan Kremer’s daughter and chief BHP scientist in residence allowed barriers to be erected to most such distractions, but since Sasha was Naomi’s son, he had access. And she gave in, more often than not.

Thus, when Wotan asked to see her on a serious matter, she thought it was Sasha, and not the project schedule, he wished to lecture on. But no.

“It is time to make a decision, Hildy. In my position, I cannot, absolutely cannot go against the direction from Earth and the guidance of the best scientific advice available.”

“Father, *I am* the best scientific advice available.”

Wotan shook his head. “No, Hildy, you are my headstrong little girl, too stubborn, too committed, too involved. I know you.” He tried to smile kindly. “Even if maybe you are right, why are you so impatient? The project will be tried again, in fifty years, in five hundred. What does it matter, now that we live so long? I am sorry, dear, but your efforts to get people to try to make me change my mind have not had much effect. I am saying no.”

How did he know? Not that she'd made any great secret of her visit to Lobov, or the university chancellor or the local news outlet people; but she hadn't done that publicly and AIs weren't supposed to spy on personal communications. Then she thought about the quiet student in Lobov's office and the mysterious warning she'd gotten on the way. The conclusion that led to chilled her.

“Father, are you having me followed?”

He smiled. “The security service, such as it is, has someone keep an eye on you, yes. It is precautionary only, for your own protection. This they do for me, and the other council members and their families, too, so it is nothing to be worried about.”

Oh, chaos! Security was in the hands of a Consolidationist! Hilda couldn't find words. Everything fit together now in the wrong way. She gritted her teeth. Tse Wen, Brad, and Sarah were counting on her to make this impactor launch happen. A knot grew in her stomach. Come on, girl, she told herself, you're supposed to be a genius. There has to be a way out. Oh, where was the way out of this? She thought about timelines, construction rates, terminal guidance, ways to cheat, crazy stuff that she didn't have time to analyze. Time. Then it hit her.

“Father. Look, we can have it both ways. I can have a second impactor built, and we can launch the first one at the old time and the second one at the new time, and divert or hold the second one when confirmation of the original schedule comes in.”

He shook his head. “Which it will not. Then we'll have this whole conversation over again!”

“I can live with that.” But could she? It cut through her like a knife.

Wotan laughed. “You are like the condemned prisoner who put off his execution by promising to teach the king's horse to talk. I will not die. You will not die. And I doubt very much this horse will learn to talk.” He scrunched his face in thought. “This idea of yours will give you, what, thirty days, before we would need to divert the first impactor? No, I think that would be too late. We will make that twenty days—before we step up to peak power. You have twenty days to prove beyond any doubt that the day after tomorrow is the correct impactor launch date, or you will shut down the impactor propulsion.”

“But the other impactors...”

“Brunhilda Beatrice Kremer, I am enough of an engineer to know that in the very unlikely event you are right, they will have made provision to divert the other impactors as soon as they see ours isn't there. Twenty days. This is what we plan,

this is what we will do.”

“New Antarctica days,” Hilda said. That would make it just over a terrestrial month. She smiled inwardly at her small victory. Sarah had sent personal messages all along, and her last message had arrived in the final stages of impactor launch preparation. The next one should arrive just before the final power ramp-up.

Wotan shook his head with a laugh. “*Ja*, New Antarctica days.”

* * * *

Hilda found Sasha waiting for her with drinks when she returned to Hadley’s. She suspected that, over the months, he’d even started to anticipate her moods. That usually pleased her, but tonight she once again felt drained, betrayed, hopeless, and yes, even a bit desperate.

He handed her a glass of dark red liquid with a twinkle in his eye. “They just started distributing this new vintage from our grape vines. I got us a bottle!”

“Thanks,” she said. “Sasha, I...”

His lips covered hers, stopping her from saying she wasn’t in the mood. With a sigh, she kissed him back perfunctorily. Then she drained her glass.

He filled it again. “Something wrong? Want to talk?”

She took another drink and shook her head. “Later.” The stress seemed to become a little less unbearable. Sasha’s young hands were all over her, she noted almost abstractly. The initial buzz of the wine was warming her, and she made no effort to dissuade him.

The petting felt good, maybe just what she needed. Getting in the mood, she pulled on his waistband and guided him to her bed. But, as their clothes found their way to the floor, she glanced at the camera pickups in the room and tensed up. Of course, the system had eyes everywhere. There were very good, unbreachable safeguards built into the artificial intelligences that ran the system and normally, nobody thought of them. But her father, she knew all too well, often considered himself above the limits imposed on ordinary people. She imagined the safeguards breached and Dad, his agents, and all their friends watching.

“Hilda?” Sasha asked. “What’s wrong?”

She looked at him. Still maybe three or four years from full maturity, he was beautiful as well as handsome. Maybe because of the wine, or pheromones, or just reaching some limit on how much she was willing to fear, she felt her attitude change. To hell with them. She gave in to desire.

“Ouch!”

“Oh, sorry!” Hilda pulled her fingernails out of Sasha’s skin, stroked him soothingly—she hoped—and laid her head on his shoulder. “Too much happening today; I’m somewhat mixed up inside.”

“Well, I’m not.”

She laughed and went along for the ride.

Afterward, she let her head relax into the softness of his neck. Sanity faded back in and with it all the worries, all the things that had to be done. How much could she ask of Sasha?

“I’m using you,” she said, staring him in the eye. “And I know that’s what I’m doing.”

Sasha grinned, his wide glistening eyes bored into hers, and he squeezed her hands. “If this is being used, use me! Whenever you want me, Hilda. Go ahead. It’s okay.”

“I hope you don’t hold it against me later.”

He shook his head and chuckled softly. “Actually I was hoping someday we could share space or something. Maybe a trial contract? Maybe...”

She put a finger on his lips and shook her head. “Maybe, someday, when I’m not three times your age, and you know a little better who you are.”

He sighed and looked pleadingly at her. “Whenever you want me. Whenever.”

She bit her lip. There was using and then there was really using. But she was in a bind.

“Do you like Bach?” She reached over the bed for her bag and pulled out a music wand.

“Oh. Classical music?”

She nodded and a fugue filled the room. Then she nuzzled her head into the pillow beneath his. They’d have to have sensors in the pillow, or on their faces, to pick up what she’d say now. Not impossible, but maybe more than they’d bothered to do. She hoped.

“Can I really trust you?” she whispered in his ear. “Completely?”

“Sure,” he said. “What is it?”

“Do you believe me when I say that the impactor has to be launched on time, that the delay message was bogus, and that the entire project depends on that impactor getting pushed to the impact point at the right time with the right velocity vector?”

“Uh, sure, Dr. Kremer.”

She laughed softly. So in his mind, the Dr. Kremer that ran the BHP was not the same person as the naked woman beside him. Like an ancient Greek goddess, her various aspects must be given separate names.

“We may have to defy local authority to do it. There will probably be consequences.”

“For you, anything!”

“You know how pushing the impactor works—by shooting a torrent of tiny pellets at the reflector fields? Like pushing a paper cup with a water hose?”

“Yeah, that’s pretty basic.”

“Right. Well, the launch time and velocities of the pellets are arranged so that they arrive in a steady beam to provide constant thrust. The last pellets to arrive at the impactor have the longest distance to go, and they need a head start. Power requirements almost triple at that point. Anyway, Wotan is giving me until then to find evidence that the delay message is wrong.”

“That’s ... uh, only twenty days from now!”

“Yes. The problem is that the only jury Dad will believe is loaded against me: Dr. Lobov and his students. I’m reduced to hoping for some message from Sol to come in that explicitly mentions the schedule, which no message is likely to do because the schedule has been fixed for years! I need you to help me keep it going anyway.”

“Let me get this straight. When...”

“Quietly. I want you to help me do that.”

“I could end up frozen,” he whispered.

She hugged his body closer to hers. “They wouldn’t execute you...”

Sasha laughed. “No, no, that’s ‘ennay’ talk for being put on ice—uh, they take you off the net and confine you to quarters. That’s the worst, unless, of course, you want to be terminated. That’s only been done once—a girl had a baby by someone that dumped her, so she dumped the baby. Outside. When her ice got clear, she didn’t want to live with that memory. So instead of being frozen, she asked to be allowed to die. She took some pills. Anyway, getting frozen is still pretty bad.” He looked at her directly. “But I said anything. What is it you’d want me to do?”

Hilda kissed him softly and whispered, “Ask your mother if she can find a way to prevent the AI controlling the beam driver arrays from following Wotan’s orders for a couple of days.”

“Sure, but why me?”

Hilda put a finger to his lips. “I have a feeling everything I say to Naomi is very closely monitored.” She told him about the incident on the way to her conference with Wotan. “So this may be my last chance to communicate honestly, and I’m taking a chance on that. You need to tell her that everything I say to her from now on, I will say with the expectation that our Consolidationist friends, Wotan’s security people, or both are listening in.”

All languidness had fled. Sasha was wide-eyed. He looked around the room, as if searching for bugs. “Do you think that they, ah, are watching us?” he whispered.

Hilda laughed. “I don’t know.” To the room, she said, “Are you?” and watched Sasha’s expression. “Just kidding,” she added, wishing she meant it.

Sasha kissed her cheek. “What do you think Mom can do?” he whispered.

Hilda thought hard. On one hand, the less Sasha knew, the less trouble he would be in. On the other, it was likely her last best chance to communicate freely to Naomi. “Okay. An AI is supposed to obey authority as long as it doesn’t get anyone hurt. When authorities conflict, it obeys the higher one. I’d argue that since the BHP is a project of all humanity, and I am its representative, I outrank Wotan as far as the BHP is concerned. That’s the case she needs to make. I’ve already filed all my physics objections.”

“Aren’t the AIs smart enough to choose because of that?”

“Not where human orders are concerned. What I’m counting on is that first, the fact that I’m right means people might be harmed if it doesn’t go as planned. That appeals to the first law of AI ethics. Second, I have a case to be in charge, and that should work for the second law.”

“Sounds like a lock to me.”

Hilda shook her head. “If I can think of it, Father will think of it and so will other people who will come up with a way to counter it. Naomi or Ted might come up with something better. Sasha, I’m a physicist. I want to see if all the little strings sing the way we tell them to. This cloak and dagger stuff leaves me with a pain in my gut. I wish Sarah were here.”

“Sarah?”

“Dr. Sarah Levine. She’s a lot more, well, enthusiastic than I am. She’d be having fun with this.” And, Sasha, too. Hilda thought. Oh, would Sarah have fun with this young man.

Said young man put his lips on hers. She melted into him, then found herself sobbing uncontrollably.

* * * *

Chapter 4

Hadley’s Hotel, New Antarctica,

14 Nov 2273

Hilda watched the impactor launch from Hadley’s, alone. It was less dramatic than the launch of a starship. The program brought up the pellet wind slowly, to avoid exciting any vibrational modes in the long thin structure. It took an hour for the violet reflection plume to grow bright enough for the cameras to see.

Okay, we’re off, Hilda sent to the operations crew at the control center. It was all deliberately low key, given Wotan’s reluctance and the political problems that made for anyone associated with the project.

Naomi sent back a feed full of cheers, totally innocent. Except that Sasha gave Hilda a big wink. Hilda smiled, poured herself a brandy, and went to sleep.

* * * *

A month later, Ted Abila looked at the highly magnified and enhanced view of the departing impactor relayed from a big interferometer telescope in the orbit of the giant planet Amundsen. The pellet streams of a hundred-thousand-plus beam projectors converged in a very narrow, ghostly cone on the head of the impactor, visible only by the red lights strung out along its length. At the tip of the cone an intense glowing ring sparkled with the detonations of millions of particles each second and gave rise to a diaphanous rose of varicolored light, an ever-shifting

aurora of recombining ions that trailed back along the length of the impactor. Delicate as it looked, the ethereal flower represented a wind of billions of newtons pushing on the immaterial magnetic sails of their baby. The long iron rod had absorbed an unbelievable amount of energy from the solar arrays circling Erebus, almost as much energy by now as its entire rest mass. Possibly all for naught.

The beauty of it made Ted sigh. Already two light days distant, its velocity was up to eight tenths of light speed with three days to go. There still had been no confirmation of the launch dates, new or old, however, and Wotan was still adamant about turning the beam drivers off, as Hilda was about keeping them on. He knew that she was right; the delay message cited fringe physics that very few who knew anything took seriously. He had hoped he wouldn't be forced to act on his knowledge.

The time had come, however, to choose between his career, his position here at New Antarctica, the trust of its leadership, and the completion of the most ambitious project begun by humanity since the terraforming of Venus started. He had made that choice and would honor it.

He touched the net for the AI controlling the beam array. *Thorin, confirm shutdown cancellation authority.*

Shutdown cancellation may be ordered by the designated representative of the Erebus council chairman, currently Wotan Kremer. It may also be ordered by this AI if needed to save human life. Finally, Dr. Hilda Kremer, as representative of the Human Commonwealth for the Black Hole Project, may cancel shutdown if needed for the continuity of the project, if physically present at the control center and not under duress.

Thank you, Ted answered.

Ted stared at the beam reflection aurora for another minute, then sent a prearranged message to Sasha. They had debated whether Hilda should have come and camped out at the project control center, but had decided against that as being too risky. It might signal their intent to defy authority. The cover story—that she was coming out to tell the staff about the shutdown in person—should be plausible enough.

But Ted had thought long and hard about the words “should” and “plausible enough.” He had decided he was not going to risk everything without a fallback position. So he also sent a message to his brother at Bee, innocuous enough, but containing the word “disestablishment.”

The next four days, he thought wryly, would be very interesting.

* * * *

Two days later, by simple chance, Hilda happened to be looking down from her balcony into the courtyard of Hadley's when Sasha, just back from the operations center, walked through on his way to the elevator. The staff was replacing the breakfast tables with casual rounds, creating something of an obstacle for him to weave his way through.

They rarely met casually anymore—not a falling-out, but simply reflecting mutually incompatible schedules and the fact that Sasha had other more appropriate “projects of his own.” Nonetheless, Hilda felt a kind of parental or sisterly fondness, and she was very happy to see him. Her eyes followed him across the courtyard.

She suspected why he had come; the truce between her and Wotan was over and the war she did not want was about to begin. The look on his face told it all. He was miserable about something.

One of the staff turned to speak to Sasha. The face looked familiar. In a moment she had it. He was the lean, goateed “student” in the corner of Dr. Lobov's office when she had first come. As Sasha left the courtyard, the man waited a bit, then left his table. With an almost military bearing, he followed Sasha—as did two other workers. Hilda stepped back from the balcony, her mind awlwhirl piecing it together.

Security. Minders. They could be there only for one purpose—to keep her from going off planet. It meant they knew about the plan.

She smiled to herself. They didn't know she knew they knew, at least not for a couple more minutes. She looked down; there was another balcony below her. Almost without thinking, she snatched a sheet from the bed, tied it on her rail, and was over and on the way down as the room announced Sasha's presence at the door.

The lady in the room below had the double doors open. She looked up from a puzzle with wide-eyed shock as Hilda plopped down on her balcony.

“Dr. Kremer! Is there something wrong?”

“Yes, but I can't take time to explain. I need to use your room portal to get out!” Hilda said as she brushed by.

“Of course, but...”

Hilda was out the door and didn't hear the rest as she fled to the right. Security would be watching the outside, she imagined. So if she simply ran out of the building, it would likely be into the arms of her father's security forces.

“Sorry!”

Lost in thought, she'd bumped a group of Moslem women headed into the women's room. Hilda looked at the long dresses and beautiful headscarves and wished she had time to ask about Shira.

“My fault. Not paying attention to where I was going ... Shira?”

“Hilda! I hoped you might be here. My mother and aunt wanted to...”

The two friends looked at each other.

Shira pulled Hilda close to her ear. “What's wrong?”

Hilda squeezed her arm. “It's too complicated to explain, but I have to get out of the building quickly, without someone seeing me.”

Hilda stared into her old friend's dark eyes, silently pleading. Shira would be risking a lot to help her.

Shira didn't hesitate. “You could wear my scarf and coat, then leave with our group.”

Hilda was dumbfounded, but there was no time to argue. She nodded. “That might work.”

“Come!” Shira urged.

The little tone in Hilda's head signaled an urgent message. It was from Sasha.

Hilda, are you home? It's urgent!

He must know about the people following him. They had gotten to him, of course. There's no way a twenty-year-old could resist that kind of pressure from authority.

I'm with a friend, Sasha. Is everything okay?

I'd better talk to you in person. Can't explain.

It's going to have to wait a couple of hours. Make yourself at home. I'll be back about 1900.

Then she exercised her option to drop off the net.

Five minutes later, covered from head to toe and in the middle of a group of

similarly costumed women, Hilda walked out of the lobby. Ten minutes later, keeping only the scarf on her head, she was on the tube headed for the spaceport.

The *Fram* was in dock under the mammoth dome, due out in three hours, but getting on it would be a problem. If she tried to sign on the normal way, security would have her in a moment. Touching the net would immediately reveal her location, as would using any comm station. She made do with keeping her head down to avoid what comm cameras she could locate.

Finally, she spotted a tall man in a uniform with a *Fram* crew patch on the margin of the landing field, watching some robots maneuver a large piece of equipment onto a dolly. Hilda removed her scarf altogether. She decided to take the chance and walked up to him.

“Hello. I need your help.”

“Huh? You are?” He brushed a shock of sandy hair from his forehead and scratched his head. He had a thick moustache that wiggled a bit when he spoke.

“Dr. Hilda Kremer. I have to get out to the project control center. Hans Bluth is trying to stop me, so the less I have to tell you about it, the less you’ll be involved.”

“Security! What makes you think I won’t call them right now?”

“I’ve gotten lucky twice today. Once more is all I need.”

He laughed and offered his hand. “Vanya Karinoff. Are you sure you want to do this?”

Hilda nodded.

Karinoff sighed. “Well, I’m about done here, and I think this is something I should bump up to the Captain. Of course, he’s on the ship.” He gestured to the huge dark egg standing to the side of the field.

Hilda smiled. “Let’s go.”

They had to walk almost a hundred meters across the cold polished rock, utterly alone in the crisp still air. This would never work, Hilda thought. She felt totally exposed. They would be watching for her. At any moment she expected a squad of security officers to surround her. It was the longest hundred meters she’d ever walked in her life. She watched her breath condense into a thin fog. Through it, hundreds of people wandered, ate, talked in the upper galleries around the landing field. Most watched her casually, some not so casually.

Then, finally, they reached the ramp, climbed it, and were in the ship.

“This way.” Her escort led her down the toroidal corridor that circled the base of the ship.

Hilda breathed a sigh of relief as they moved out of view of the entrance. With a great deal of good fortune, she would be in orbit by the time Sasha and his security escort ran out of patience.

“Outboard number ten,” Karinoff said. “Captain Martee’s in and will see you. I’ve got to run.” He tipped his cap.

“Take care, and thank you, thank you!” Hilda gushed.

He gave her a quizzical smile and a brief wave as he disappeared quickly around the bend.

Was there a warning in that smile? Hilda knew nothing at all about Captain Martee. She briefly considered fleeing around the bend the other way and ducking into a closet or something to stow away. Probably wouldn’t work, she decided. There’d be cameras and other sensors in every place big enough for a person. Instead, she focused her mind on the task at hand. She had one more person to sell on the merits of her cause. She touched the entrance pad of the door, and it hissed upwards.

What she saw hit her like a brick in the stomach. The room was nicely appointed, with pictures of historical spacecraft on its curved walls and comfortable-looking aerogel furniture with shiny metal tables and a desk placed throne-like in its center. There, behind what was presumably Captain Martee’s desk, sat her father, Wotan Kremer. He was not smiling.

“You are going to answer some questions, Brunhilda,” he said.

Focus vanished; she felt a renewed chill in her veins. Time momentarily stopped. Then a light jet of odorless gas caught her in the face.

* * * *

Four days later, Hilda and Naomi were brought to the council chamber by security escorts. Wotan was there, with Naomi’s father Akaabe, Dr. Lobov, Security Minister Hans Bluth and several council members. The wall at the end of the chamber displayed an image of the still-accelerating impactor. The place smelled of a fresh cleaning.

That smell reminded her of the hospital room where she had spent three of the last four days—in a drug-induced stupor. Presumably, she had told them everything

she knew, but she couldn't remember anything more than soft lights, quiet voices, and the clean, antiseptic smell of the place.

Yesterday, she'd woken in her bed in her hotel room, turned into a prison cell. The doors would not open and she had no net access. The last time Wotan had done that to her, she'd been eight years old. He was all smiles now. The beam projectors had been shut off four days ago, the off pulse arrived at the distant object two days ago, and the view of what happened would reach New Antarctica in a few minutes. He wanted to rub it in, she suspected.

A very determined self-destruction, Hilda thought. Her father's reputation would never recover from this—he would pay for his role in sabotaging the project through as much of eternity as he cared to live. So let him have his fun now. She walked stiffly to a seat and glared at him, wondering if he would see any of the pity in her anger.

“We are a community of laws and of authority deriving from the collective,” Wotan declared after everyone had been seated. “Five of us have tried to put themselves above those laws.”

Naomi's father jumped in before Wotan could say anything else. “Your daughter represented the collective of humanity. One can make the case that it is *you* that has defied it!”

Wotan sighed. “Akaabe, I have the floor. Does disrespect run through your entire family? Wait your turn. If legitimate authority is not heeded, we have chaos. Is there some small chance that the message directing us to delay the impactor launch was not genuine? Perhaps. But the decision concerning what to do about it lies with the collective and not with individuals. We are here today to show that legitimate authority succeeds because it represents the will of many, and many have cooperated to uphold it. Colonel Maluk.” Wotan gestured to a man that Hilda recognized as the bearded “student” in Lobov's office, who now wore some kind of gray jumpsuit uniform with discrete pips on its shoulders along with the New Antarctica patch below his right shoulder.

“Thank you, Mr. President. Formally, this is a disciplinary hearing to state charges and recommendations concerning the behavior of Brunhilda Kremer and Naomi Abila in willfully disobeying lawful directives of the representative of the council. A jury of peers will be assembled to judge the gravity of the offense, the prospects of a repeat, and the appropriate action, unless the respondents waive that procedure in favor of a determination by the council president. Which, I might add, would save a great deal of trouble in an open-and-shut case. The three who have fled in exile to Bee have, for all intents and purposes, chosen their own fate.”

Hilda barely heard a word, the voice itself taking all of her attention. It was, of course, that of the dark stranger who had accosted her on the way to visit her father

after the conversation with Dr. Lobov. Colonel Maluk, of course, was a Consolidationist and probably had been promoted as such by Hans Bluth.

Wotan nodded. “Thank you, Colonel. We will hear from respondents and representatives in a moment. Now is the time to see the futility of their efforts. In precisely ten seconds, the beam will cease to push the impactor.”

All eyes went to the screen. At the appointed second, the glowing ring at the head of the impactor vanished and a wave of darkness shot backward, extinguishing the aurora of its progress.

“Thy will be done,” intoned Hans Bluth.

Wotan frowned at him. “We have a secular proceeding here. And it was our collective will.”

The security minister smiled. “As you will have it, Mr. President.”

“Damn!” Colonel Maluk shouted and pointed at the wall, “That isn’t funny. Give us the real feed again.”

Hilda turned to the wall screen again and gasped. The reflection aurora was back again, somewhat wider, she noted, and the cone looked like it was coming in at an angle to the impactor, as if from a different direction.

Wotan closed his eyes momentarily, then said in low, measured tones. “It is not, apparently, a jest. The beam that has resumed pushing the impactor is coming from Bee.”

He glared down from the council table, first at Naomi, then at Hilda, looking for all the world like a cornered animal prepared to deal death to its tormenter at the first opportunity.

“Ted did it!” Naomi squealed. “He got Bee to keep pushing the impactor.”

Wotan brought his ceremonial gavel down on the desk so hard that it broke, but nobody so much as tittered in the silence that followed.

“We are still in session here,” he said, “the stakes of which have been raised considerably by this *unforeseen* treachery.” He turned to Maluk.

“The respondents didn’t know about this,” growled the Colonel. “Our methods are reliable.”

“Wotan,” Hans Bluth said. “This is what *you* get for being so sanguine about those elitists setting up their own government.”

“And what would you have done?” Wotan snapped back. “Organized some kind of an expedition against them? Start interstellar warfare?” He turned to Hilda. “Brunhilda, I don’t care if you didn’t know about this ... this scheme. You are responsible for it. I hold you completely responsible.”

Then he sighed and shook his head. “For chaos’ sake, what can we do now? Allow me for a moment the fantasy of thinking I have been correct in this, and assume that we have sent an impactor six months ahead of schedule. What are our options?”

Hilda spoke as evenly as she could. “We send word ahead. Our transmissions will arrive months before the impactor. It wouldn’t receive terminal guidance anyway and would miss the impact site by several astronomical units. Then we send the other one on the revised schedule. This is what we should have planned to do anyway; the effort to not send the impactor on the original schedule was never anything more than a Consolidationist plot to sabotage the project!”

“The remorsefulness of the respondents is noted,” the security minister intoned, getting nervous chuckles throughout the room for his irony.

“Enough, Hans,” Wotan said. “Brunhilda, I suppose you would maintain that it isn’t necessary, but would you humor me and send word forward as to what has happened?”

“I’ll need to have my net access back.”

“Wotan...” the Colonel growled.

“Peace, Maluk,” the security minister said. “She’s done all the harm she can. Your access is restored, Dr. Kremer.”

It was like having her sight restored. Hilda quickly had the incoming backlog sorted for messages from the Solar System; there were a dozen text messages and a video of a celebration at the BHP institute. Tse Wen, Sarah, and Brad were there. Hilda checked the time stamp and smiled inwardly.

“This needs to go on screen, everyone,” Hilda announced seriously.

Wotan shrugged and nodded.

The party scene lit up the room in contrast to the previous spacescape. Dr. Sarah Levine, in a painted-on black thing with an impossibly plunging neckline, came to the fore.

“Hi, Hilda, and everyone, from 11.63 years ago. We’ve timed this party scene

to arrive as you celebrate the completion of your impactor launch...”

There was an audible gasp from Wotan and several others. Dr. Lobov got up and made his way out of the room.

“...when ours will be on its way, too,” Sarah’s image concluded.

The screen went dark. “You’ve made your point, Brunhilda,” Wotan said.

“Can we go now?” Hilda asked.

“This is still a disciplinary hearing,” Colonel Maluk said. “The merits of the issue are beside the point. I will remind you that a number of people here and in the Solar System do not regard a success of the BHP as a good thing. At any rate, you broke our laws.”

Wotan nodded. “You are out of order, Colonel Maluk, but correct.”

“Dad!” Hilda shouted. “We’ve saved your reputation. We saved you from the consequences of the biggest—”

“Quiet!” Wotan shouted. Then he added, more gently, “Some things, however true, are better left unsaid. I appear to be acquiring some hard-earned wisdom in that respect. Unlawfulness is still intolerable, whatever the result. Will you accept my judgment? And will you, Naomi? Or do we have to go to trial?”

Such a trial would savage her father, Hilda realized. He would lose his council presidency. Someone else would preside over the completion of the terraforming project. She couldn’t do that to him, or to those who supported her. Wotan’s blood was still strong in her, after all.

“Mr. President,” she said formally, “Naomi and the others followed my direction. I had both project and local authority under you. What was done was my responsibility. Leave them alone and I will submit without trial.”

Wotan looked at his ministers who, under the circumstances, appeared to want a trial no more than he did. At any rate, Hilda saw all the heads nod. Colonel Maluk sat, impassive, lips tight.

They were, Hilda knew, rapidly exchanging views over the net of what should be done with her. She had a pretty good idea of what the decision would be as well. It seemed the only one possible. All her dreams of coming home again, of reconciliation, of seeing New Antarctica bloom, were likely gone.

Finally, Wotan tapped the gavel head on the desk, waited for quiet, and said one word, hard and cold. “Exile.” He looked to his right and left. No one objected.

Then he got up and left.

Hans Bluth reached over and took the remains of the gavel. "I, I will entertain a motion to adjourn."

One of the other members mumbled something.

"Hearing no objection, these proceedings are adjourned." He shrugged and set, rather than pounded, the amputated gavel head down. Everyone started talking as the councilors unceremoniously filed out of the room.

As the chamber emptied, Naomi and her father came up to Hilda, who still had her security escort. The guard backed away a couple of meters to give her space.

Naomi hugged her. "This will blow over. He'll get over it."

Hilda shook her head as tears ran down her face. "I'll go to the Vertex, I think. Try to make myself useful there. Maybe I can come back someday."

"I'll miss you. We'll all be thinking of you twelve years from now, you can count on that."

Twelve years, Hilda thought bitterly. Twelve years was the time it would take the impactor to get to Vertex plus the time the news of what happened would take to get back. One fifth of her lifetime so far.

She smiled inwardly at that thought and tried to imagine how she would view the passage of twelve years when she was a million years old, or a billion. Then she thought of some unfinished business with someone for whom a dozen years was still half a lifetime. The sentence would take effect quickly, she realized, and she might not get another chance.

"Sasha?"

He came over to her, looking miserable. "I'm sorry. They ordered me to cooperate, Dr. Kremer, and..."

Hilda placed her finger on his lips, then wrapped her arms around him and gave him a long, sensual, unabashed hug. "No hard feelings," she said. "Take care of yourself. Have fun. We'll see each other again, someday. Okay?"

He smiled. There were the beginnings of tears in his eyes.

She brushed her lips against them briefly, then wordlessly turned and left the room. Naomi walked back to Hadley's with Hilda, past the school, the lake, and the other places of their childhood. She had been home such a short time.

She was off planet again by 3400 that day.

* * * *

From her room a week later, Naomi pulled up a view from the Amundsen astrogration facility. Under moderate magnification and viewed from almost directly behind, the back-splash of a departing starship looked like a ring of fire, or rather a circular aurora, with the ship itself a particularly brilliant spark in its middle. Hilda is there, she thought, probably cold-sleeping through the high acceleration departure. At four gravities, she would be near enough to Vertex to see the impact within hours of the event.

It was, she noted with some irony, Fathers' Day on the New Antarctica calendar, and she reminded herself to send a message ... no, she would walk over. It had been at least a week. He would lecture her about getting involved in politics and then smile because he was secretly proud that his daughter had done something wonderful. They would share a hug that was all the more precious for the cold edge in Wotan Kremer's voice when he had sent *his* daughter away again. Naomi asked whatever gods there might be that a tiny bright new star lay at the end of Hilda's journey—that Wotan had not sent her from one broken dream to another.

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(EDITOR'S NOTE: "Imperfect Gods" is another tale of the Black Hole Project, the beginnings of which were chronicled in "Kremer's Limit" [July/August 2006].)