

WARP DESTINY



A Novel

MATTHEW REDIFER

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*To the powerful women in my life — my wife, my two
daughters, and Mom*

PROLOGUE

The night sky was now filled with pinpricks of reflected light, a continuous shower of slow moving meteors. The display was beautiful to many; to others, contamination—hiding the true mysteries of the universe that unfolded only in real darkness.

One object stood out, brighter than the rest, following an arc set deeper in the sky than the others. This was no stray ship or satellite, but a sprawling space station, humanity's greatest gravity-defying feat yet.

The station was so massive its shape could be discerned with the naked eye, sometimes even in daylight. With the aid of a small telescope, two massive rings slowly spun in opposite directions about a steady central hub.

Part laboratory, part shipyard, the station stood as a testament to how high humanity could climb with singular purpose.

Zooming closer, a sleek starship hung from one of the central hub's docking ports, surrounded by work platforms. Tethered cables stretched along the hull, temporary lifelines to the venerable ship. Along her flanks, suited workers moved in slow motion, their tools casting brief flashes of emerald light that vanished into the dark.

At the far end of the station's spine, robotic arms locked the starship's habitat ring in place while workers toiled along its perimeter. Nearby, another ring floated, larger and silent. Newly finished, the surface was still flawless from final assembly.

Thousands of small viewports dotted the spinning rings, glowing like scattered stars. Through one, past layers of alloy

and glass, a man bent over a transparent console, his face lit by the shimmer of code and data.

He worked intensely as though the weight of the universe rested solely on his shoulders.

Just outside, in the stillness between Earth and space, the starship waited for whatever he might unlock.

PART 1

“There is something irreversible about acquiring knowledge; and the simulation of the search for it differs in a most profound way from the reality.”

— *J. Robert Oppenheimer*

CHAPTER 1



For decades, humanity's expansion into space crept forward in measured steps. Progress accelerated once fusion power became widely adopted, heralding an end to the Great Decoupling and new investments in space.

Commercial operations were the catalyst for growth, allowing the public-private partnership of the Warp Drive Consortium to form. Lunar mining operations were producing rocket fuel. The space elevator and lunar shuttles made colonizing Mars possible. Ice mining there held great promise to surpass the Moon in capacity.

Mike Renner's assignment aboard *Kepler Station* placed him on the largest of three orbital assembly and research facilities, the other two circling the Moon and Mars. From here, the new era was unfolding: space tourism, deep space exploration, the search for intelligent life.

For the tourists, vacations to the station resembled a luxury cruise. The brightly lit arrival concourse welcomed visitors with familiar gravity. Sunrise and sunset excursions, along with regular shuttles to the Moon, departed regularly. An entire wing of the habitat ring, with roomy cabins, high-end finishes, and a Michelin-star restaurant, was dedicated to affluent visitors.

For the workers who kept the station running behind the scenes, it was an unremitting life of spartan accommodations and processed food. The luxuries in space were reserved for paying customers.

For Mike, the commercial activity that helped finance humanity's more esoteric ambitions might have been happening in another world. His detail with the WDC occupied his full attention. He had been married to Helena for five years, and accepting the assignment meant delaying a family yet again. But Mike wasn't one to ruminate on the consequences of his choices. This was a historic mission. Their success could unite humanity as an interstellar species.

Whenever he caught a glimpse of the glowing Milky Way beyond the viewport, it was enough to remind him the sacrifice was worth it.

Mike's focus remained fixed on the upcoming test. As team lead on the warp drive integration, his responsibility was to certify flight-worthiness of the warp drive control system. Sub-scale vacuum tests on Earth had already proven the theory sound. Now it was time to take the final step: the *Astraeus*, the first starship equipped with a warp field generator.

At the heart of the control system was the Heterogeneous Quantum Computer, the most advanced computing system humanity had ever built, designed to keep the warp bubble stable during transit.

The next test wouldn't be a flight, but a full-scale simulation. The HQC's trial by fire.

Mike knew the sim engineers would be waiting for him, ready with their artificial gremlins, eager to see where his system would crack this time.



Outside, the *Astraeus* rested against one of *Kepler's* docking nodes. The ship was designed from the ground up to carry

humans to the edges of the solar system. Now she was being modified to carry them beyond. She was the oldest of three Columbia-class starships. The others were *Pallas*, now deep into an extended survey of the Saturn system, and *Perses*, dispatched on a decades-long mission to investigate the massive, unexplained gravity anomaly beyond the Kuiper Belt.

The Columbia-class was defined by its long cylindrical, symmetric hull, with the command deck at the nose, and three fusion engines housed at the stern. When not ejecting plasma for thrust, the fusion reactor shifted into its quieter duty: feeding the ship's electrical power grid.

Clusters of chemical RCS jets dotted the *Astraeus's* circumference. They allowed the ship to move with the feather-light grace of a ballet dancer. Their clean geometry contrasted with an unmistakable break in the ship's profile: the habitat ring interface.

In full configuration the ring circled the ship's midsection like a luminous halo, slowly rotating to provide near Earth gravity during the interplanetary crossings. The ring was necessarily counter-balanced by a rotating flywheel aft of the interface.

Wide enough to house crew quarters, laboratories, and a small observation deck, the ring was connected by three spokes, one containing the reinforced access tunnel. And because danger traveled with explorers, the ring was designed to separate, providing a lifeboat should catastrophe strike.

Just beyond the ring were the four powerful OMS thrusters, used to assist the ship achieve and change orbit. Moving forward the vessel narrowed into the bullnose-shaped command deck. The viewport was a continuous

sweep of DNA glass, a near-indestructible, transparent composite grown molecule by molecule. The glass doubled as a HUD surface painting meta data across the stars.

The command deck was arranged with functional precision. At its center rose the holographic operations console, a low circular dais capable of blooming navigational maps, system diagnostics, or comms in a lattice of blue light. Around it curved the stations that monitored the ship's operations: science, communications, helm, engineering, and the captain's post, each one trimmed in soft glows of status lights.

Station starship master builders now drifted along the habitat ring's outer skin, installing the most daring modification in the *Astraeus's* storied history: the warp field generation system. A network of emitters hugged the perimeter of the ring, their housings shining like polished obsidian. Along the ship's hull, teams worked methodically around the newly mounted warp field generator housings, the massive coils still exposed, their scale hinting at the charge they were built to store. When complete, the modifications would siphon power directly from the upgraded fusion reactor, braiding it into the warp field bubble, the cocoon of spacetime the ship would soon ride within.

For now, the *Astraeus* waited. Engines idle. Ring detached. Strobe lights pulsing softly against the blackness.

CHAPTER 2



Mars' chance at becoming something grander failed miserably billions of years ago. Mars was now a rusted and desolate planet turning slowly beneath a cold Sun. Dust storms drifted across the surface, sweeping over scarred plains and long-dead riverbeds, erasing traces of the past with indifference. The great chasm of Valles Marineris carved a wound across the face of the planet, a thousand kilometers wide and deeper than the Grand Canyon, a reminder of a more violent time.

The canyon walls gave way to a glint of steel, an island of human defiance just beyond the cliffs of Coprates Chasma. This was the Mars *Ares Spaceport*, an outgrowth of the Mars Mining Consortium. A landing platform sat between twin cylindrical towers anchored to the canyon floor. Each tower was encircled by a rotating ring of offices where Mars's weak gravity was artificially augmented. Along the hillside, a large glass dome shimmered in the light, connected to the platform by an elevated tram line. Farther out, a massive fuel refinery was under construction, its tall cranes rising above the rust-red plain. From above, the scene looked surreal, a snapshot of modern civilization pasted atop a dead world.



For many back on Earth, life still hovered between comfort and collapse. The first red city promised new beginnings,

whispered through romanticized recruitment ads—a fresh start for those willing to trade warmth for dust.

But for Jacob Hale, that vision slowly faded.

He spent most sols deep below the surface, searching for ancient ice locked inside frozen aquifers, which the MMC planned to refine into deuterium fuel for the fusion-powered starships. The pay was decent, though capped because the med team limited the miners' hours in the low-g environment. He wired most of what he earned back to Earth, where his estranged family still lived beneath real skies.

He once believed Mars might change his fortunes, but Mars couldn't change the past.

What remained of his salary went to his basic needs—which wasn't much. The MMC provided room and board as part of the contract. With a few extra credits and too much idle time from the short shifts, he spent more free time than he should at the bar in the underground habitat ring.

However, today Jacob felt reenergized.

After weeks of tunneling through brittle strata and iron dust, his team finally struck something vast. This was the ancient lake they were searching for. The science team insisted there was one here, a relic from a time when Mars still remembered warmth. The MMC had gambled everything on that claim, constructing the entire spaceport in this canyon to tap the water beneath.

Now, the miners were switching the operation from exploration to extraction, preparing to pull the first full size core from the glacial vault below. The Director was growing nervous, the investors even more so. Now, finally, they had their ice. Jacob's team just mined where they were told to. Regardless they would be getting a nice bonus for this.



The drilling rig's steady thunder was so constant that Jacob hardly noticed it anymore. Down here, forty meters under the Martian surface, beyond the dome's air and warmth, the ice crowded close. Every vibration from the drill rattled through his boots and into his bones.

Then, without warning, it stopped—ending in a metallic screech that echoed through the tunnel.

His anticipation for the first ice core extraction collapsed. The tunnel settled into an unnatural stillness. He'd heard the drills shut down countless times before, but never screech like that.

"Vexa?" he called into his suit comm. "What gives?"

Static hissed, then her voice came through, tight and strained. "The drive locked up and entered auto shutdown. Torque readings spiked past redline before I could react. The head's jammed."

Jacob ducked under a support strut and made his way to Vexa standing over the drill's remote console. The display showed a flashing red icon where the drill status telemetry usually was.

"What the hell did we hit?" he muttered.

Vexa wiped a sleeve across her visor. "Doesn't read like ice or basalt. Reflectivity's too high, density's through the roof. The sensors can't classify it."

"Ok, reset the motor drive and back it out," said Jacob as he leaned over the console.

Vexa switched the drill into reverse and thumbed the reset. The rig shuddered, the shaft inching upward before grinding to a halt again. She exhaled, hit reset a second time,

and the drill head finally lurched free, rising with a low metallic groan.

The moment the bit cleared the bore, she killed the power. The machinery wound down in a slow mechanical sigh.

Jacob and Vexa left the console and crossed to the mouth of the bore to investigate, steam still drifting in the air.

The drill head was a ring of scorched ice, blackened around the edges where the drill had bitten in. Inside the borehole, something deep below glistened faintly under the lights.

Jacob straightened slowly. "That's no rock."

CHAPTER 3



The hum in the *Astraeus* propulsion bay was settled into a rare stillness. The usual clamor of the ongoing retrofit was gone, replaced by the low, steady vibration of power flowing through the test systems. Patched conduits and open access panels ran along the walls, temporary compromises required to support the upcoming simulation.

The HQC sat deep within the propulsion bay fully integrated into the ship's power grid. For this test, its control signals were routed not to *Astraeus*'s actual warp field emitters but to the simulation mainframe on *Kepler*. This setup allowed the simulator to interpret every command the HQC issued and adjust the modeled spacetime field in real time. The engineers referred to this configuration as Hardware-in-the-Loop simulation, or HIL for short. This was as close to the real flight test they could get before lives were put at risk.

So far, every run failed to maintain a stable warp bubble through the entire jump sequence. Each time a weakness in the control law or bug in the hardware was uncovered. This was the point of the HIL campaign. Harden the HQC's logic until it could hold a bubble steady under any conceivable flight condition.

Of course no one dreamed it would take this long. The scale-up from the lab tests should have been straightforward. The WDC had given them a long leash, but Mike was

beginning to sense time was running out on his team to deliver the final configuration.



Blue light washed across the command deck, casting faint reflections around the perimeter. At the center of the command pit, the ship's holographic twin rotated slowly in midair, projecting a luminous image of the *Astraeus*.

Rhea Imani, standing at the engineering station, scanned the propulsion board, watching the last of the diagnostics settle. "All systems go. HQC core synchronized. Warp coils fully charged."

"Controller standing by for activation."

At the forward helm station, the operator glanced back over his shoulder. "Stable attitude confirmed. Guidance solution loaded."

Mike stood next to him at the captain's station with his hands clasped behind his back, eyes tracing each status indicator, willing them to stay green. "All right. Start with the low-gain set. I want to see how the new control loop behaves before we enable the adaptive gains."

Rhea's fingers moved in a smooth, practiced arc across the console. "Low-gain set confirmed."

The entire vessel was now wrapped in the glow of a luminous blue sphere.

"Helm?" Mike asked.

"Ready," said the operator, one hand lightly resting on the thrust lever that today only served to trigger the simulator. "Course plotted and locked."

Mike drew a slow breath, then nodded. "Activate."

The operator pressed the detent, pushing the control past max thrust to the warp engage position, a simple modification to the stock thrust lever that spoke volumes. “Warp drive...engaged.”

“Warp bubble adapting...curvature stable,” Rhea replied, eyes fixed on the readouts. “Control holding. Temporal shift beginning.”

The holographic ship shimmered as energy rippled outward from the generator nodes spaced evenly around the ring’s perimeter. The bubble adapted quickly to the activation transient.

Mike allowed himself a small breath. “That’s a clean start. Phase alignment looks better than the last run. Ramp up to full gain.”

“Complete. Temporal shift accelerating. We’re jumping.”

“Standby one...”

“Ok, feedback loop is stable, gains adapting,” Rhea said, smiling faintly. “Looks like it’s behaving, for once.”

“Don’t say that,” Mike murmured. “You’ll jinx it.”

Right on cue, a single tone pierced the quiet. One of the graphs spiked crimson.

Rhea’s smile vanished. “Phase deviation in sector seven—small, but rising.”

Mike leaned in. “Early jitter, maybe. Adjust the spatial filter and monitor.”

Rhea worked quickly, muttering something under her breath. “Correction applied...and—no good. It’s accelerating.”

“Freeze the learning rate,” Mike said. “Don’t let Hawk chase it.”

“Learning rate fixed.” Her eyes widened. “Sector nine’s picking up drift too.”

Mike's pulse ticked faster. He pulled up a secondary display as the bubble's symmetry unravelled in apparent slow motion. "We're generating asymmetric field states...trying to stabilize..."

The bridge dimmed as the simulated bubble rippled, its surface distorting into jagged waves. The ship twisted while the projection fractured into ribbons of light.

"Force a halt on the core executable," Mike barked. "Quickly!"

"Command failed!" Rhea's voice rose. "The feedback loop's locked the controller—"

The lights flared white.

The image of the *Astraeus* shattered, scattering into static. The alarm cut through the silence like a knife.

Then, nothing.

The bridge was still again, filled only with the faint hiss of cooling air. The holographic ship was gone.

Rhea stared at the empty space. "Simulation terminated," she said softly. "Vehicle integrity lost."

Mike's reflection stared back at him from the console. "Complete destruction."

"Total. The warp bubble inverted on itself."

For a long time, neither spoke, the weight of the moment weighing down on them, that wisp of doubt settling in again.

"Could be another kernel bug," Mike said at last, even though he knew that was unlikely.

Rhea crossed her arms. "Or maybe those photonic relays could be glitching."

He sighed. "No way to measure that in real time."

"No," she said. "And if it's a kernel bug, we'll be chasing another ghost hidden in millions of lines of code."

Mike leaned against the console, staring at the error logs. His voice dropped to a whisper. “We’re trying to train a machine to shape spacetime. Sometimes I wonder if it’s even listening.”



The engineering conference room on Kepler was built for efficiency, not comfort. A polished steel table with a glass top stood at the center, surrounded by an assortment of mismatched chairs, with a holo projector mounted on the ceiling. The air smelled faintly of coffee and ozone.

Mike sat forward with his elbows on the table, eyes fixed on the data cascade suspended in midair, a digital replay of the latest simulation run in which the *Astraeus* had, once again, imploded.

Across from him sat two simulation engineers looking calm, analytical, and perhaps a little too satisfied.

“So,” Mike said finally, “you managed to break it again.”

“Not exactly how I would characterize it,” said Tarek Kassim, the lead simulation engineer. He was tall, angular, with a habit of smiling at the wrong times. “We introduced three controlled anomalies this round—minor perturbations to test response robustness. The algorithm held until the gain increased, then spiraled.”

Rhea sat beside Tarek, scrolling through the diagnostics on her tablet. Her expression was cool, but her foot tapped lightly under the table, a telltale sign she was likely to get defensive.

Mike’s gaze didn’t move from the holo. “Let me guess. You increased the warp curvature noise profile?”

“Marginally,” Tarek replied. “Within design tolerance.”

Rhea looked up sharply. “The photonic relays are pushing light-phase modulation at their operational limit. You’re overdriving the response loop.”

“That’s the point,” said Dr. Senka, the systems modeler, tapping the table for emphasis. “The simulation exists to find where it breaks. If the drive control can’t survive light-phase noise at high gain, it’s not flight-ready.”

Mike raised a hand. “Alright, let’s stay focused. The control algorithm performs perfectly at low gain. Smooth vector field, stable spacetime curvature, energy balance within limits. But once the gain increases, the field goes nonlinear. Rhea thinks that’s due to relay phase jitter.”

Rhea met his glance. “Yes. The photonic relays can’t maintain synchronization. The loop lags, and the phase error compounds.”

Dr. Senka shook her head. “The model’s designed to emulate actual spacetime conditions. We don’t simulate relay hardware, only the underlying physics.”

“Exactly,” Rhea shot back. “Which means your anomaly injection is causing a hardware performance issue that’s not real. The control algorithm’s pushing the hardware beyond spec because your simulation’s introducing unrealistic noise.”

Tarek folded his arms, unruffled. “Or maybe the control law itself is brittle. You’ve optimized for low-gain elegance, not high-gain resilience. The anomalies shouldn’t bring it down unless there’s a hidden instability in the feedback loop.”

Mike rubbed the bridge of his nose, trying to stay patient. “Let’s think this through. The warp drive’s control matrix regulates curvature gain through sensor feedback. It should adapt dynamically to perturbations. But these failures all

occur in the the outer curvature shell. That suggests we're finding a limitation in the geometry solver.”

He stood, pacing slowly around the table, the projection light playing across his face. “The algorithm might be interpreting energy feedback as curvature drift instead of amplitude gain. That would explain the runaway oscillation.”

Rhea frowned. “But that only happens when the phase timing slips. Which means—”

“Which means you might both be right,” Mike said quietly. He looked up at Tarek. “You said you introduced three anomalies. What were the other two?”

Tarek brought up a schematic. “We added a one-percent energy offset in the boundary layer and an asymmetric gradient across the compression front. Minor. The third was a temporal pulse—one-hundred-millisecond noise injection.”

Mike nodded slowly. “And the failure propagated immediately after the gradient skew.”

“Yes,” Tarek confirmed.

“Then it's geometric,” Mike said. “The control system's feedback loop over-corrects for the asymmetry creating an undamped oscillation in the field curvature. At low gain it's handled. At high gain, it tears itself apart.”

Dr. Senka leaned forward. “So your geometry model can't handle dynamic asymmetry.”

Rhea arched an eyebrow. “But the sim is creating unphysical distortions.”

“Enough,” Mike said sharply, then softened. “Look—the simulation did its job. It found another weak point. We'll adjust the geometry solver to treat asymmetric gradients as distributed loads instead of singular distortions. That should damp the over-response.”

Tarek looked thoughtful. “You think that'll hold?”

Mike's mouth quirked in a tired smile. "We'll find out when you try to break it again."

Rhea added dryly, "And next time, maybe don't try to break it by setting the universe on fire."

That drew a small laugh from the engineers. The tension eased just slightly.

As they began packing up their tablets, Mike lingered by the holo projection, watching the ghostly warp envelope shimmer before fading out.

Every failure brought them closer, he reminded himself. But they didn't have forever to keep trying, either.

The line between a stable warp field and catastrophic collapse was razor thin. Somewhere in that space, hidden between the equations, was the key to FTL travel. They'd have to unlock it soon, before someone pulled the plug.

CHAPTER 4



When the MMC science team finally arrived at the drilling site, the tunnel walls were frosted over. The drilling crew had retreated to the staging dome, leaving the excavation site sealed and silent. Only Jacob and Vexa stayed behind to meet the new arrivals. They were two planetary geologists from the MMC science lab. Neither seemed uncomfortable in the pressurized suits or intimidated by the underground complex, which surprised Jacob initially.

Dr. Sera Khatri spoke first, her voice clipped and professional over the suit comm. “Mr. Hale. You said the formation was encountered at a depth of twenty-three meters below us, correct?”

Jacob nodded, gesturing toward the frozen bore. “That’s right. Routine core extraction. First one from this sector. We were cutting through the ice sheet—nothing unusual until the drill hit something.”

Sera stepped forward, scanning the material embedded in the drill head with a handheld spectrometer. The beam danced over the bit, refracting in muted colors. Her frown deepened. “Composition doesn’t match any known natural Martian mineral phase. Elemental ratios are wrong. There’s unusual crystalline structure—almost like microfabrication.”

“Fabrication?” Jacob echoed. “You mean...this material was made?”

She didn’t answer immediately. She moved over to the bore hole, her gloved fingers brushed the rim, tracing the fine

grooves in the ice. “The scan resolution from orbit showed evidence of subglacial layering, but nothing like this. Whatever this is—it’s older than the overlying strata by hundreds of millions of years.”

The other scientist, Dr. Alvarez, studied the display of the portable scanner they’d brought. “Subsurface radar shows a hollow structure about thirty meters below—arched corridors, maybe chambers. It’s artificial, Sera. No question.”

Jacob felt his breath catch. “Artificial? You’re confirming we’re standing above ruins?”

Alvarez managed to keep his tone matter-of-fact, but his voice betrayed his bewilderment. “Not just ruins. Something built and then buried deep, a long long time ago.”

Dr. Khatri turned to him sharply. “Let’s not speculate.”

“Ok,” Alvarez said, “but the scanner doesn’t lie.”

Jacob called down two of his crew and, under the close supervision of the scientists, they began cutting an access tunnel beside the existing bore. They used low-heat plasma saws to avoid disturbing the underlying layer. The air shimmered faintly from the energy discharge.

After several hours, the last sheet of ice sheared off and slid away, revealing the structure beneath. They pulled the techs out of the tunnel, and Jacob rappelled down, boots crunching against ice as he steadied himself. His helmet cam switched on, projecting the first close-up view to the team clustered around the console above.

The surface was tiled with smooth, glasslike plates nestled edge to edge. The drill had shattered the tiles at the impact point and embedded in a cross beam.

Faint etchings ran across the tiles in looping curves and branching lines, catching the helmet light like copper veins trapped under the glaze.

Jacob brushed a glove along the nearest tile. The etched lines formed precise spirals, intersecting triangles, and repeating ridges. They were worn by time, warped by pressure or perhaps heat, but unmistakably intentional.

Vexa let out a low breath. “That’s not natural fracturing. Those are markings.”

Dr. Khatri stared for a long moment, her expression unreadable. Then she spoke, her voice barely above a whisper. “Carbon dating won’t help us here, but isotopic analysis of the material should tell us the age of the structure.”

A silence settled over the tunnel, thick and electric. The only sound was the faint crackle of their suit heaters fighting the cold.

Alvarez broke it first. “If this is what it looks like, then we’ve just rewritten Martian history. Maybe even our own.”

Sera nodded slowly. “Jacob, get me some clean samples of the tile.”

Her gaze turned to the team, steady and grave. “Until we know what we’re dealing with, no one utters a word. Understand?”

No one answered. They all almost simultaneously glanced back down at the dark opening where something vast and ancient waited beneath the ice.

CHAPTER 5



The search for extraterrestrial life within the solar system was expanding. Sample return missions to the moons of Jupiter and Saturn confirmed microbial organisms, augmenting the finds on Mars. No complex life forms were identified.

Scientists believed Enceladus with its buried oceans warmed by Saturn's gravitational tides might cradle something more evolved. But the landers that pierced the icy crust returned only simple microbes clinging to mineral veins. *Pallas* was in the system now; perhaps answers awaited in the depths.

The results seemed to confirm that Earth-like worlds, where liquid water endured and starlight was stable, were the true crucibles for intelligent life. And now humanity possessed the tools to analyze them properly. The Infrared Synthetic Aperture Telescope (IRSAT) was now online. IRSAT, a constellation of satellites whose linked optics formed a vast virtual mirror, could now resolve the spectral fingerprints of alien atmospheres. This was the kind of machine that could read the breath of another world.

Now a newer idea seized the scientific imagination. The recent warp drive experiments on Earth revealed something unexpected. When a warp bubble formed, it left behind a faint halo of ionized dark matter. The signature persisted for a time after the bubble dissipated. If these traces could be seen around distant worlds, it could only mean another civilization was bending spacetime.



Sandra Vaziri devoted her career to the search for extraterrestrial life. She grew up captivated by Earth's living beauty that once teetered on the edge of ruin. The age where humanity nearly choked in carbon was past. Now, with the engines of industry again turned upward, the opportunities to further her research dramatically increased.

Sandra, who held a PhD in astrophysics from MIT, had previously worked aboard *Kepler*, home to the IRSAT control center. Now she was back in her Cambridge lab, surrounded by banks of humming processors, sifting through IRSAT data. The great discoveries wouldn't come directly from the observatories themselves, but from the sleepless patience of scientists like herself who combed terabytes of data until meaning surfaced.

The silence haunted her. So many worlds in the habitable zone. So many atmospheres that whispered of promise, and still no definitive sign of intelligence among them. Somewhere, she felt, the universe was hiding a clue in plain sight, a signature buried beneath the noise. Life was out there; it had to be. Perhaps the key wasn't just in the light, but in the darkness. That residual glow of warp ignition, that faint ionized shimmer of intelligence written across the stars.

If they could find just one such trace, humanity would no longer be alone.



The lights in Sera's lab were now dimmed, the only illumination coming from the soft wash of the data screens. Rows of processors purred quietly in the background, their

cooling fans a steady counterpoint to the clicking of keys. Evan's eyes flicked between columns of spectral graphs, each one a potential window into another world.

He rubbed his temples. "I think I'm starting to see everything in bands of infrared."

Sandra didn't look up from her terminal. "See, I told you we'd make you super human."

He gave a weak laugh. "I wish."

"Did the latest batch finish parsing?" she asked, leaning back in her chair. The glow from her monitor outlined her features—sharp, precise, the kind of focus that made graduate students both inspired and terrified.

"Just wrapped up," Evan said, swiveling his chair to face her. "Three hundred terabytes from the northern field. I've filtered out the noise from instrument drift and thermal scatter, but we're still swimming in candidates."

Sandra typed a command, her screen filling with columns of data from Evan's analysis. "That's where the new filter comes in. I shifted the algorithm to weight for weaker methane-ozone overlaps."

Evan blinked. "That'll kill a ton of noise, but won't it throw out some borderline candidates?"

"Maybe," she said. "But life doesn't advertise with perfect spectra. It whispers."

He frowned thoughtfully and leaned over her shoulder as she ran the algorithm. The data churned through in a blur of cascading numbers. Then, one by one, a handful of small, spinning pale blue dots appeared accompanied by their spectral graphs.

Evan's eyes widened. "How many is that?"

"Looks likes seven," she said quietly. "Out of nearly three thousand."

“That narrows it down a bit. What are we seeing?”

Sandra highlighted one candidate’s spectral line—a jagged curve with two narrow troughs. “See that? Methane absorption at 3.3 microns, and ozone at 9.6. Weak, but synchronized. They shouldn’t coexist naturally for long. Something has to replenish them both.”

Evan sat back slowly. “So maybe industrial activity?”

She nodded. “Extrapolating from the historical atmospheric patterns on Earth, these numbers should reflect an advanced civilization, possibly centuries ahead of us.”

He stared at the screen, silent for a long moment. “Where is it?”

“IRSAT-662’s outer companion 662c,” Sandra said.

“Roughly one point two Earth radii. Temperature’s borderline cold, but with that atmospheric mix, it could support a biosphere beneath cloud cover.”

Evan ran a hand through his hair. “We could be looking at a warp capable system.”

Sandra smiled faintly, but her eyes stayed on the data.

“Could be. But remember, patterns lie.”

He hesitated. “You don’t sound convinced.”

“Cautiously optimistic,” she said, her tone even. “But we’ll need a convincing story to get time on the DMD.”

“You’ve been chasing this for years, haven’t you? A real signature.”

She didn’t answer right away. The monitors hummed, the graphs glowing faintly in the dark.

“Not too long ago,” she said at last, “finding Earth-like planets in the Goldilocks zone was extremely rare. IRSAT changed the game. Now we’ve catalogued tens of thousands. But none of them ever spoke back, not in any incontrovertible way.”

Evan watched her in silence.

Sandra reached forward and froze the image of the seven candidate worlds—faint, imperfect, each one orbiting its distant sun. “Maybe,” she said softly, “somewhere out there, chemistry crossed the same line it did here. And life found a way. Civilization arose.”

Evan’s voice was almost a whisper. “And we might be the first to know.”

She leaned back, eyes reflecting the ghostly planets. “Actually, the first to *listen* closely enough to hear.”



The late afternoon sun fell over Cambridge casting amber bars across the conference table. MIT’s dome could be seen through the wide windows of the Astrophysics Department’s main office, standing as a monument to centuries of discovery and the bureaucracy that often slowed it.

On one screen, the spectral graphs from Sandra and Evan’s IRSAT exoplanet analysis appeared.

Sandra stood beside the display, a calm intensity in her eyes. Across from her sat Dr. Elise Kwan, chair of the department, known for her surgical precision both in thought and politics.

“You’re asking,” Elise said slowly, scrolling through the proposal, “to reconfigure the Dark Matter Detector on *Kepler Station*. That means at least three weeks of lost time, maybe more, and it pushes half a dozen research teams off the schedule, including one group waiting a year for their window.”

“I know,” Sandra said. Her tone was measured, but her hands betrayed her excitement. “But this isn’t just another

observation run. We have a chance to detect a signature that no one thought to look for before.”

Elise looked up over her glasses. “You’re talking about the ion trails from the warp drive experiments.”

“Yes.” Sandra leaned forward, tapping the screen to bring up a three dimensional image: faintly glowing arcs suspended over a simulated planetary system. “The lab tests at ICWR confirmed it. When a warp bubble forms, it leaves behind a residual ionization pattern in local dark matter. It’s stable, measurable, and unique. Nothing else in nature that we know of produces it.”

“And you think you can find that same signature light-years away?”

Sandra nodded. “If we can adapt the DMD’s phase-contrast array to look for ionized dark matter particles around exoplanets, we can identify worlds where someone has recently activated a warp drive. That’s not just a hint of life, Elise. That’s proof of intelligent, technological civilization.”

Elise leaned back, considering that. “You realize how extraordinary that claim is. Every time someone comes in here talking about ‘signs of intelligence,’ it ends in a retraction or worse a career ending embarrassment.”

“This isn’t wishful thinking,” Sandra said. “It’s physics. We’ve seen the phenomenon ourselves—a byproduct of spacetime manipulation, nothing else. If it shows up around an exoplanet, it can only mean one thing—someone there built a drive too.”

Elise studied her for a long moment, then said, “You’re proposing to use one of the most sensitive instruments ever built for particle detection as a telescope.”

“As an imager,” Sandra corrected gently. “The DMD’s ultra-high resolution is designed to map the galaxy’s dark matter density. With a few modifications to the modulation filters and retuning of the quantum amplifiers, we can translate dark matter ion flux into a spatial field. We’ll actually be able to visualize the warp signature.”

Elise gave a small, skeptical nod. “And in the process, jeopardize a dozen funded projects and your own reputation.”

Sandra hesitated, then softened her voice. “Elise, think about what we could confirm. For the first time in human history, we have a known, physical signature of intelligent activity beyond electromagnetic noise. We’ve been searching for centuries for someone to talk to, but maybe they’ve already been moving among the stars. We just didn’t know what to look for.”

The silence stretched. Outside, the city hum of Cambridge blurred faintly against the glass.

Finally, Elise said, holding back a thin smile, “You’ve always been impossible when you believe in something.”

Sandra smiled faintly. “Persistence pays off.”

Elise sighed and looked out at the fading skyline. “You’ll get a week for mods and another two of instrument time. I’ll inform the scheduling board. But no permanent modifications. You’ll need to coordinate changes with *Kepler* operations. Got it?”

Sandra exhaled, a smile breaking through her composure. “Understood. Thank you, Elise. I won’t waste it.”

“I hope not,” Elise turned back to her. “Otherwise I’ll be dealing with the fall-out for years.”

CHAPTER 6



The *Ares* Science Lab was located on the lower level of Tower One, a juxtaposition of the MMC's drilling-site analysis needs and the scientists' quest to unravel the planet's ancient secrets. The air always held a faint tang of dust, an omnipresent reminder of the world outside.

Spectrometers, electron microscopes, and soil ovens were arranged neatly around the perimeter. Rock samples sat on every surface. Workstations hummed quietly, screens glowing with spectral fingerprints of Martian rock.

In the center sat the holographic projector, a waist-high column of polished steel. When active, it blossomed into a rotating silhouette of blue light depicting terrain or sub-surface scans that hovered in the air like sculpture. Scientists often circled the holo, hands folding through the projection as they argued theories or marked drilling locations.

Even at this low level, the wind sometimes whipped against the outer shell of the tower. The scientists barely noticed anymore, always intently focused on their work.



Tonight the lab was silent except for the soft hum of the environmental controls. Everyone except Sera had left for the dome hours ago. The scientists were expected to monitor their time in the low-g lab, favoring the higher gravity of the

office rings or the familiar pull of simulated Earth gravity in the spinning underground habitat.

Sera spent too much time here, and the med team was beginning to notice, warning her she might not be cleared to return to Earth unless she took their recommendations seriously. She wasn't sure she cared. She was born on Mars to Earth parents, but she identified as a Martian.

Sera stood at the center console, eyes fixed on the holographic display hovering above it. Layers of spectral data and isotopic readings rotated slowly, a three-dimensional ghost of the structure the mining crew had uncovered.

When the door cycled open, she didn't look up. Only one person keyed the lab that way.

"Still at it I see," came Dr. Lionel Garrison's voice. He was not surprised to find Sera still in the lab. "You'll never sort this mystery out on no sleep."

Sera allowed herself a tired smile. "I haven't slept much the last few sols. This finding, it's beyond belief."

He crossed the lab and stood beside her, hands clasped behind his back, studying the projection. "Ah, yes. The impossible layer."

"The impossible structure," she corrected. "It's too organized, too deliberate." She switched the holographic display to a magnified view of tile sample recovered from the site. "The elemental analysis shows complex alloying—nothing like the natural silicate-metal blends we see in meteorites. And the age estimates put it at around 3.7 billion years."

Lionel's eyebrows rose. "3.7 billion." He exhaled softly. "That's when Mars still had oceans but biological life was just emerging on Earth."

Sera nodded. "Yes."

They stood in silence for a while, the refracted coral light from the exterior illumination spilling across the instruments.

Finally, Lionel spoke again, his tone thoughtful. “You know the accepted history. Mars was Earth’s older brother, just unlucky. Formed from the same cosmic dust, cooled faster, burned out sooner. Its magnetic field collapsed, atmosphere bled away into space, and the surface froze. End of story.”

“But we did find microbes,” Sera said quietly.

He smiled faintly. “Confirmed microbial life, yes, though no one can agree when they prospered. Some isotopic signatures point to the Noachian era, others to the much later Amazonian. A billion years apart, at least.”

Sera turned to face him. “But if those microbes were ancient and they existed before the magnetic field collapse, then Mars may have had a stable atmosphere rich in oxygen long before Earth did. And that changes everything.”

Lionel tilted his head. “You’re suggesting complex life.”

“I’m saying it’s possible,” she replied. “On Earth, the Cambrian explosion happened just a few hundred million years after oxygen levels spiked. Once the chemistry was right, complexity followed fast. Mars was ahead of us in nearly every stage of planetary evolution. It could have reached that threshold eons earlier.”

He frowned slightly. “But it didn’t last.”

“No, and neither will we,” she responded.

After a moment she continued, “Something happened around three and a half billion years ago. The dynamo shut down, the iron core stopped spinning, the atmosphere stripped away. Without a magnetic field, the solar wind sterilized everything. Whatever lived here...died with the planet.”

Lionel's gaze drifted to the viewport—the brilliant stars contrasting with the bright, hazy cones of the exterior lights. “Three billion years of erosion, bombardment, and dust storms. There shouldn't be anything left. Not even fossils.”

“That's what we thought,” Sera said. She turned the display back to the scan of the buried structure, those impossible geometric corridors beneath the ice. “But this, this was sealed under ice. Buried. Protected. Preserved.”

He studied the projection, expression unreadable. “If it's what it appears to be, then it means complex life did evolve here. Intelligent life. Long before Earth ever cooled enough for oceans.”

Sera's hands trembled slightly as she shut off the display. The room dimmed, leaving only the faint glow from the dimmed lab lighting.

“Lionel,” she said quietly, “if that's true, our models of solar system evolution are wrong. Mars didn't just die early it lived early. It reached the peak before Earth ever began.”

He regarded her for a long moment, then smiled. “We've made our share of mistakes, so often letting our human experience influence our path,” Lionel admitted. “For decades, we assumed our solar system would represent the norm for others in the galaxy. Then came the flood of exoplanet data, and suddenly we were the outlier. Even now, the sample size is too small for high confidence in any model.”

Sera looked back out the window, towards the horizon where the suspended dust created a brownish-red tinge against the starry background. “There is another possible explanation,” she murmured.

Her gaze turned back to Lionel just as he spoke. “Hm. I don’t recommend bringing that up with the Director tomorrow.”



Sera stepped off the underground tram and into the open concourse below the base of Tower Two, the thin light of the morning filtering through the windows high above. The air still carried the faint chill of the night cycle. She still hadn’t slept much.

Lionel was waiting near the barrier rail, hands folded behind his back, watching the tram doors slide shut.

“You look like you spent the night arguing with the data again,” he said.

“There was something I missed. The sample—the electron scan shows embedded circuitry.”

“Really? Are you sure?”

“Yes, I missed it initially,” Sera replied, falling into step beside him. “I guess I was too focused on the surface features and the elemental analysis. The AI says solar cells, although confidence is low. Nothing in the database matched the layout. I think we’re looking at roofing tile.”

“Okay, I suggest we keep that to ourselves until we can get an engineer to take a look.”

“Agree.”

He glanced at her. “You ready for this?”

She exhaled. “As ready as I can be to explain the unexplainable to a man who already knows what conclusion he wants.”

They crossed the concourse toward the tower’s central glass elevator. The doors slid open and they stepped inside.

The concourse disappeared beneath their feet as the cab began the ascent.

The elevator braked as it reached the transfer level. The doors opened onto the vestibule, a narrow, circular chamber wrapped in bands of light. Beyond the inner hatch, the office ring rotated slowly.

They stepped inside. The hatch sealed behind them with a muted thud. For a moment there was only the familiar Martian gravity clinging to their bodies.

Then the floor began to move.

The vestibule rotated, slowly at first, then faster, the world reorienting beneath their feet. Sera felt the unnatural pull build through subtle pressure in her calves, then her hips, until gravity asserted itself, heavy and undeniable.

They stepped out through the vestibule's inner hatch and into the ring's transfer corridor. As they transitioned to the floor, curved hallways stretched away on either side, lights warm and steady. Offices were already coming alive, voices muted behind glass, the low rhythm of a place designed to feel almost Earth-like.

Lionel lowered his voice. "Let's be clear. What we're showing him isn't just a structure. It's stratified. Layered. And the deformation—"

"—doesn't match anything natural," Sera finished. "I know."

"And don't forget the isotopic ratios," he added.

Lionel stopped walking and turned to her. "If we hedge, he'll dismiss it. If we overstate it, he'll weaponize it. We have to thread that needle."

Sera met his gaze. "We tell him the truth. Cleanly. No speculation we can't defend."

"And if he asks the question we're both thinking?"

She didn't answer right away. The corridor seemed to hum around them, the quiet confidence of engineered gravity and human order.

"Then we stick to what the data says," she finally replied. "That whatever is under the ice didn't get there by accident."

Lionel nodded once. "All right. You got this. Let's go ruin his morning."



From the director's office, Coprates Chasma slowly turned below, a contrast of cliffs and dust plains carved by a vanished river. The mining crews worked far down, targeting the buried ice strata mapped by orbital radar. No sign of the ancient lake was visible from here, but its presence defined everything about this place.

Sera stood beside Lionel near the wide window, which looked eerily straight down into the valley, no horizon in sight. Both stood a touch too straight, as if posture alone might deflect the weight of the conversation. Across from them, MMC Director Armin Duval paced behind his desk, his sharp features lit by the soft glow of an orbital projection of the port's refinery network. His voice carried the kind of polish that came from years of selling visions to people with money.

"I don't think you understand what's at stake here," Duval said, hands slicing through the air. "The investors back on Earth are ready to pour billions into the expansion. The Fleet's warp ships will need hydrogen by the kiloton—our hydrogen. If Mars proves more efficient than lunar extraction, we'll own the off-world market for decades."

Sera kept her voice even. “No one’s disputing the importance of the ice fields, Director. But the mining crews hit a buried structure. It’s not natural. Until we know what it is, drilling any deeper could damage something irreplaceable.”

“Irreplaceable?” Duval scoffed. “We’ve been finding weird rock formations for years. The planet’s riddled with ancient volcanic pockets, mineral intrusions, ice concretions that look like architecture if you squint at the scanner wrong.”

Lionel spoke for the first time, his tone measured but firm. “Director, this isn’t a ‘weird rock.’ We’ve run compositional and isotopic analyses. The material is alloyed, engineered, not geological. The analysis dates the material to 3.7 billion years ago.”

Duval stopped pacing and leaned against his desk, studying them both as if they were crazy. “Three billion years. You realize how absurd that sounds? Mars lost its atmosphere around that time. The planet was practically dead. You’re telling me something *built* a structure here before that?”

Sera met his gaze. “Yes. That’s what the data says.”

He let out a sharp laugh. “Doctor, data says a lot of things until someone recalibrates the instrument. You’ve suspended operations across an entire sector based on a ghost reading. Do you know what that costs per hour?”

Lionel folded his arms. “Do you know what it would cost to destroy the first evidence of an intelligent civilization outside Earth?”

“That’s assuming your ‘civilization’ exists,” Duval snapped. “Right now, all I see is a mining delay that makes us look unstable to investors. The lunar consortium’s already promising double output. They’ve already got a leg up on us being so much closer to Earth. If they secure the next funding

round, this port becomes obsolete before it even finishes construction.”

Sera stepped forward, her voice steady but edged. “Director, with all due respect, your investors want proof of Mars’s potential. Imagine what confirmation of an ancient civilization would do for that—scientific prestige, tourism, media rights, government sponsorships. This could make Mars untouchable as an investment.”

For a moment, Duval hesitated, weighing the argument. Then the corporate pragmatist reasserted itself. “Speculative. Investors don’t fund mysteries. They fund returns. And right now, your ‘find’ is a hole in the ice that’s bleeding money.”

He tapped his console, pulling up a schematic of the drilling grid. “I’m reinstating operations at site twelve. We’ll bore straight through the obstruction and resume ice extraction. If your scientists want to keep poking at it, they can work off the side of the shaft.”

Sera’s expression hardened. “If you drill through that structure, you’ll destroy whatever evidence remains. The advanced materials alone—”

“—aren’t worth a hundred million a day,” Duval interrupted.

Lionel stepped closer, his voice low and deliberate. “Director, I’ve studied planetary evolution my entire life. Mars was supposed to be barren before Earth even formed its first oceans. If what we found is what we think it is, it changes the history of life in this system, maybe in the galaxy. You can’t just bore through it for fuel.”

Duval’s jaw tightened. “Watch me.”

The silence that followed was heavy enough to feel like gravity.

Sera finally spoke, her tone quiet but cold. “If you go through with this, Director, the Interplanetary Research Council will issue an injunction. You’ll be drilling into a protected archaeological site and every nation on the IRC data feed will know it before your drill hits ice.”

For the first time, Duval faltered. His eyes flicked between them, the scientist and her mentor, both standing firm.

“Fine,” he said at last, voice clipped. “The IRC? Didn’t I tell you to keep this thing under wraps? I’ll give you seventy-two hours. After that, the drills go back online. If you can’t prove this thing is what you claim, we move forward.”

Sera nodded once. “Then we’ll prove it.”

As she and Lionel turned to leave, the viewport shimmered. A low tremor ran through the canyon, faint but unmistakable. The director didn’t seem to notice, but both scientists did.

Lionel murmured, almost to himself, “The planet doesn’t like being disturbed.”

Sera didn’t answer. It was still early morning and she caught a glimpse of Phobos high in the sky sliding quickly past the small window behind Duval’s desk. She glanced back at the large viewport, where something vast slept beneath the ice. Would seventy-two hours be enough?

CHAPTER 7



The shuttle detached from *Kepler* with the soft mechanical clunk of magnetic locks releasing, a sound Mike came to associate with transitions. Through the forward viewport, the curve of Earth unfolded in silence.

The shuttle began the steady climb toward the *Clarke Space Elevator*, a gleaming thread stretching impossibly down to the surface. For all their breakthroughs in warp dynamics and quantum science, this marvel of carbon-lattice engineering still left Mike in awe.

“Heading home for some R&R, Commander Renner?” the pilot asked over her shoulder, a hint of amusement in her tone.

Mike smiled faintly. Commander? With the WDC, uniforms were unnecessary; rank was like an echo from his past, drowned beneath the hum of innovation. On *Kepler*, they were all equals, bound not by command, but by a common goal. The uniform today was only for show, a concession to travel protocol.

“Trying to remember what real gravity feels like.”

“Don’t worry,” she said, guiding the shuttle with practiced ease. “It’s hasn’t changed much.”

A few hours later, the shuttle reached the spinning terminus. The docking clamps latched, and a low hiss signaled pressurization of the airlock. Mike gathered his things and headed to the waiting climber.

He settled into the tiny cabin, stretching out on the small bed. His mind returned to the latest failure, the geometric anomalies, the stubbornly unstable curvature fields, the schedule for the next test.

The modeling error was corrected, he was sure, but the data was beginning to show something new, perhaps a discontinuity. That was concerning. There was no easy fix for undefined math.

His team had been battling the simulation for nearly five years, and the strain was beginning to show. Should he have postponed his leave until the problems were resolved?

The entire structure shivered faintly as the climber attached to the tensioned chord.

Mike's thoughts returned to home. A few months had passed since he last saw Helena in person. She'd made the same trip to *Kepler* in reverse. Five years together and half of it apart. He'd put off children again. "Just until this project wraps up," he promised last time. But the project was an open horizon, each success revealing another set of unknowns. Warp dynamics had a way of consuming everything around it.

The elevator began the long descent, and the terminal's soft artificial gravity gave way to the gentle tug of Earth's pull. As the days passed, the view outside the window transitioned from the black of space to a deepening blue, the edge of atmosphere flaring against the hull as the terminator crossed below.

Continents began to take shape through scattered clouds. Along the Andes, Mount Chimborazo, the closest point to Earth from space, rose from the mountains between the glittering Pacific and the continent beyond.

The comm panel chimed softly, an automated message from elevator control confirming atmospheric entry.

Outside, thunderheads were beginning to take shape over the equatorial landing zone, white towers rising into the twilight. The elevator climber descended smoothly through them, the vibration of atmospheric entry a whisper.

As the first drops of rain struck the hull, Mike suddenly felt nostalgic for home.

He imagined Helena waiting at the terminal, probably attempting to catch up on her reading while keeping one eye on the estimated arrival time.

He smiled, the noise inside his head easing.

Soon, the warp equations, the unanswered questions, the constant hum of *Kepler* would be behind him. For a while, at least.

And when the testing resumed, when the next simulation came alive with new possibilities, he would face it with the renewed clarity that only a trip home could give him.

The elevator climber shuddered gently as it neared its terminal cradle. The clouds parted, revealing the lights of Pacific Gateway glittering along the coastline.

Off in the distance, beyond the web of gantries, the first Orion-class starship floated in her cradle, her frame washed in the cold shimmer of floodlights. *Eos* was the name etched in pristine lettering across her hull. Her newly finished habitat ring was docked on *Kepler* awaiting her arrival. If fate allowed, she would be the second vessel to touch the stars, but only she would ascend with them.

“Welcome home, everyone, and thank you for choosing the *Clarke* elevator. Your best option for convenient access to LEO, the Moon, and beyond,” said the attendant softly over the intercom.

Mike watched the world swell beneath him and whispered back, almost to himself, “It’s good to be back.”



The maglev train whispered across the coastline, the silver fuselage catching the early morning light. From their seats near the panoramic window, Mike and Helena watched the Pacific grab for the horizon. The world below *Kepler* always felt impossibly vivid to Mike after months in orbit: the smell of the air, the emerald green of the rolling hills, the horizon that bent and stretched.

Helena sat close to him, her hand resting lightly on his arm. She wore a loose linen jacket, hair falling in soft waves that caught the light. She brought along a bottle of her family’s reserve and poured them a glass.

“Welcome back to gravity, Commander,” she teased, raising her glass.

Mike chuckled. “Feels heavier every time. Maybe Earth’s getting denser.”

“Or maybe you’ve just gotten used to floating above everything,” she said, sipping. “You look at the planet like another system to optimize.”

He smiled at that. “You know me, I like to understand how things work.”

“We’re almost there, Lena. We’re close, closer than we’ve ever been.”

Helena leaned back, swirling her wine. “You’ve said that before.”

“This time I mean it.” He looked past her, out at the ocean. “We ran full HIL simulations before I left. The geometry will

hold once we tweak the solver algorithm. When we stabilize the energy field—”

“Mike,” she interrupted gently, “Remember you’re on vacation.”

He laughed under his breath, rubbing his neck. “Right. Sorry. It’s hard to switch off.”

“I know,” she said, and smiled. “It’s one of the things I admire about you. That focus, determination. No outside distractions. But sometimes I worry you’ll lose your connection with what’s right here.” She gestured toward the window, where deep blue waves folded gently against the dark cliffs lining the Pacific coast. “There’s still a universe to explore down here.”

He followed her gaze, softening. “I miss this. The smell. The air. Everything’s so...alive. It’s true, up there, the memory starts to fade.”

“Wine doesn’t ferment in a vacuum,” she said with a smirk.

He grinned. “Actually, it does.”

Helena narrowed her eyes.

“But tell me something, Mike. Why are we so obsessed with going beyond? Every few centuries, humanity decides the next frontier will provide the answers. What if the next reach provides the final answer?”

He turned toward her, thoughtful now. “You think reaching out could be dangerous.”

“I think we’re conflicted about what we’re reaching for,” she said. “And yes, I’ve read the same articles everyone has. Some scientists think warp activation could tear spacetime or destabilize gravity. And if it really does attract attention... whose attention?”

Mike slowly, turned his glass between his fingers. “We’ve modeled every variable. The risks are controlled. And as for what’s out there...” He looked out at the dying light along the coast. “If anyone notices, I’d like to think they’re explorers, too.”

Helena studied him for a moment, then smiled faintly. “You always sound like that when you talk about the project. Like a kid with his first telescope.”

“I know.”

She nudged him gently. “Just remember there’s a world down here that needs you, too.”

He held her closer. “I won’t. I’ve got my anchor.”

Outside, the train curved inland, leaving the ocean behind. The first glimpses of the Napa Valley’s golden hills appeared, lined with vines that climbed toward the horizon.

“You know,” she said, a smile tugging at her lips, “I should probably warn you now. Tomorrow’s dinner with my parents.”

Mike groaned softly. “Already? I thought I’d get at least a weekend buffer before facing your dad’s interrogation.”

“You love my dad,” she teased.

“I respect your dad,” he corrected. “The man’s an institution. And he still crushes grapes by hand, doesn’t he?”

“Only when he’s trying to prove a point,” Helena said, laughing. “He’s been running that winery since before I was born. Helped the family keep it afloat during the Great Decoupling. Every bolt, every barrel, he knows by heart. He’s proud of that, maybe a little too proud.”

“Salt of the earth,” Mike said with a grin. “The kind of man who can fix a broken AgBot with a wrench and a bad attitude.”

“Exactly.” She nudged his shoulder. “Which means you might want to skip the part about bending spacetime during dinner.”

He chuckled, running a hand through his hair. “Yeah, last time I tried to explain warp metrics, he asked me if I could make it rain.”

Helena laughed, a warm, melodic sound that filled the cabin. “He’ll warm up once you’re back in work boots helping him fix the irrigation lines. He still says you did it wrong last time.”

“I did it exactly as he told me,” Mike protested.

“Mm-hm. Well, you’ll get your chance to redeem yourself.” She leaned her head on his shoulder, watching the vineyards blur by. “It’ll be good for you to be back home for a bit. Out of the propulsion bay, out of orbit. You need that.”

He looked down at her, her face calm, serene in the fading light. “Yeah,” he said softly.

As the hills darkened and the train hummed toward the valley floor, Mike’s gaze drifted once more to the horizon. The stars would be rising soon, obscured by the veil of progress. He knew he’d look up tonight and once again feel that pull of responsibility.

CHAPTER 8



The hum of the portable heaters and air handlers filled the expanded section of the excavation tunnel with a low mechanical pulse. Vapor hung in the air, drifting through the beams of work lights that cut against the ice. The black structure gleamed beneath them smooth and deliberate, impossible.

Jacob stood at the bottom of the pit dug out from beneath the drill's initial impact point, arms folded, his breath fogging in the cold. Sera was in front of him, crouched near the exposed surface, her scanner purring softly as she swept it across the material. Vexa knelt beside her, fingers moving carefully over the crystalline frost.

“He’s not going to wait much longer,” Jacob said at last. His voice echoed faintly through the chamber. “Duval wants the drills running again by shift’s end.”

Sera didn’t look up. “He’s going to have to wait the seventy-two hours he promised us. If we push through this without proper containment, we’ll destroy the evidence.”

Jacob exhaled through his nose, watching the vapor trail vanish. “He doesn’t believe there is evidence. He still thinks this is just a mineral seam.”

Vexa glanced up from her work, her hazel eyes bright in the pale light. “Then we’ll prove him wrong. Look at this patterning.” She aimed her headlamp along the curved edges of the tiles. “Perfect symmetry. Not a stress fracture. You can’t get that from natural ice compression.”

Sera nodded. “It’s not geology, Jacob. The isotopic readings don’t match the surrounding strata. This thing was built here...or put here.”

He rubbed the back of his glove along his jaw, the gesture more habit than thought. “Built when? Before the atmosphere collapsed?”

“That’s what makes it extraordinary,” Sera said. She stood and turned the scanner so they could see the faint three dimensional overlay. Further along beneath the ice, the dark structure continued in arches and angles with periodic internal voids. “Nothing would have survived that long on the surface. The radiation alone would have stripped it to atoms. But this...” She gestured toward the wall of ice. “This was sealed in before the atmosphere was lost. Preserved.”

“Like a time capsule,” Vexa murmured.

“Exactly,” Sera said. “And if we’re right, we’re looking at the remnants of an intelligent species that existed when Mars still had oceans.”

Sera continued, almost thinking aloud. “Perhaps our whole view of planetary evolution is biased. We believed intelligence needed Earth’s timeline. Billions of years of slow geology and chance. But now that narrative seems impossibly naïve.”

Jacob’s eyes narrowed as he studied the display. “Duval’s not going to accept this.”

“With all the evidence were collecting he won’t have a choice,” Sera replied. “We run high-resolution scans, isotopic sampling, radar mapping—the works. Once the analysis uplinks to the IRC servers, it’s in the record. He can’t bury it.”

Vexa looked between them. “He’ll try. You know he will. This site’s worth more in ice than in history to him.”

Jacob's tone softened. "That's why we do it right. No heavy equipment. Section the ice manually. If this is what you say it is, we don't get a second chance."

Sera looked up from her console. "And when Duval calls again?"

Jacob hesitated, then smiled grimly. "Then I tell him the drill hit something older than human history. And that he's going to have to wait on his damn ice."

For a long moment, none of them spoke. The heaters hissed softly, the ice walls glowed faintly in the light, and beneath their boots the alien surface reflected the inconceivable scene back at them.



The holo-channel flickered open, four faces swimming into focus through the haze of static: Director Duval in his sleek office at the *Ares* Tower Two, Lionel framed by the polished steel of his suite in the science wing located in the other tower, and Jacob and Sera in the dusty, dim-lit operations tent under the excavation dome.

Jacob started without preamble. "Director, our seventy-two-hour analysis is complete. The data confirms the initial structure hit by the drill is artificial. But there's more. Dr. Khatri will walk you through the details."

Sera tapped her console, and the hologram of the excavation flared between them, simultaneously appearing along side their images on the video link. A grid of walls and corridors carved beneath the ice appeared, their lines too precise to be natural.

"As you can see," she said, "these aren't fissures or glacial formations. The structural composition shows manufactured

alloys, fused silica, and symmetrical architecture consistent with habitation. We also found signs of stress on the tiles that form the upper surfaces.”

Lionel leaned back in his chair. “Wait, what are we looking at here? A city grid?”

“We're not sure yet,” Jacob said. “We're at the limits of the portable scanner’s range. But I'm convinced the site isn’t geology.”

Duval let out a low breath, folding his hands. “Doctor, you’re certain of this?”

Sera nodded. “Beyond reasonable doubt. The data speaks for itself.”

A small smile ghosted across Duval’s face. “Well then, that makes it easy. You’ll get your suspension order. Mining ceases beneath this dome effective immediately. I’ll notify the board.”

Jacob blinked, surprised. “That’s it?”

Duval shrugged, almost amused. “The northern ice fields are proving more expansive than we thought. Investors are happy. If we can spin this find into a cultural or tourism venture, all the better. People will pay a fortune to walk through the ruins of an ancient Martian city.”

Lionel chuckled. “Never underestimate the marketing potential of a mystery.”

Sera frowned. “This isn’t a theme park, Director. We need scientific control and preservation protocols before anyone touches that site.”

Duval raised a placating hand. “Of course, Doctor. You’ll get your science. But the IRC will need to fund the rest. My budget covers ice and ore, not archaeology.”

Jacob nodded, masking his relief. “Understood, sir. We’ll prepare a full report for IRC transmission within the day.”

“Good,” Duval said, leaning back. “You’ve done impressive work down there. Journal articles, documentaries, maybe even tourist brochures. Mars could use a little romance.”

Duval’s comm line clicked off, leaving the others in stunned silence.

After a moment, Lionel exhaled, half-grinning. “Well, that went easier than expected.”

Sera crossed her arms, still staring at the holographic projection. “Too easy.”

Jacob looked at the glowing outline of the buried city. “Let’s just hope the IRC sees what we see before Duval starts selling tickets.”



The excavation site had grown into a network of tunnels and scaffolds, a frozen Pompeii carved from red rock and ancient ice instead of volcanic ash. Portable lamps threw golden arcs across the translucent walls, their light swallowed by the depths of shadow. Beyond the immediate glow, the shapes of half-buried structures emerged in angled ridges and broken spires. An imprint of a thoroughfare ran parallel beneath the ice.

From above, the stitched together scans now clearly showed a small city grid.

It was fractured and warped, the surfaces eroded by eons of shifting ice and rock, but the symmetry was unmistakable. Tall buildings now collapsed inward like the ribs of something long dead. Even in ruin, there was intent in the layout. Design. Purpose.

Jacob stood at the bottom of one of the new excavation tunnels, staring up through the frost toward what had once

been an elevated structure now half-sunk in ice. The roofline was caved in, leaving a ragged aperture framed by black metallic ribs.

Sera was kneeling beside him, her scanner emitting a low, rhythmic tone as she swept it along the lower surface. Vexa hovered behind her, datapad in hand, her breath visible in the air.

Jacob broke the silence first. “You’re sure that’s an entrance?”

Sera didn’t look up. “Look, threshold symmetry, reinforcing beam along the arch. The composition matches the outer structure.”

Vexa leaned forward, shining her headlamp into the dark gap. The beam disappeared almost immediately into blackness. “Hard to believe this was once above ground,” she said softly. “If the city went down this deep, whatever buried it must’ve come fast.”

“Or from above,” Jacob said. His voice was low, thoughtful. “The debris patterns...look at the angles. The collapse didn’t start from the ground. Everything’s been crushed downward.”

Sera looked over her shoulder. “You think it came from outer space, maybe an asteroid impact? Samples haven’t shown any signs of shock-metamorphosed minerals.”

“I don’t know,” he admitted. “Could’ve been an impact. Could’ve been something worse.”

Vexa’s tone was hushed. “Like a bombardment?”

Jacob didn’t answer right away. He walked closer, crouching beside Sera to examine the dark surface. Faint scoring marred the structure’s outer layer. Long, shallow gouges ran parallel across what had once been smooth metal. Tensile fractures, buckling, something violent.

“This city wasn’t abandoned,” Sera said, almost to herself. “It was destroyed.”

Vexa shivered, though the heaters kept the chill at bay. “Ages ago. Whatever did this, we were still crawling out of primordial oceans back on Earth.”

Sera nodded absently, still watching the scanner feed. “And yet here it is. Streets. Buildings. Architecture. That entrance leads into something larger. My readings show hollow space beyond it. At least ten meters deep.”

Jacob stood again, peering into the darkness. “Could be an internal chamber. Maybe intact sections under the collapse.”

Vexa glanced at him. “We’re not actually going in there, are we?”

He gave a wry smile. “We’ll see. First we send in the drones.”

Sera looked up sharply. “Portable units only. I don’t want thrusters kicking up debris that’s been untouched for eons.”

“I’ll get two of my best recon drones prepped for entry,” Jacob said.

They watched the entrance together, the quiet hum of the air handlers filling the silence. For a moment, none of them spoke.

Finally, Vexa broke the stillness. “You realize this is insane, right? Mars didn’t just have life. It had civilization. Cities. Industry. Maybe even war.”

Sera met her gaze. “And we’re standing on its grave.”

Jacob glanced at the dark opening once more, the light from the lamps glinting faintly off the edges of the alien metal. “Actually,” he said softly. “We’re standing at its door.”

CHAPTER 9



The Viotto family winery was a fixture in the Napa Valley for generations, a lasting defiance against the modern world of glass and steel which now encroached on the horizon.

The sun was setting over the distant high-rises as the rows of vines stitched into the hillside caught the filtered light and turned gold. This land still breathed slowly, the warm earth radiating an aroma of ripening fruit, the crisp air carrying the scent of roses.

The main house stood at the valley floor, an old ranch-style home expanded thoughtfully over time. The wraparound porch glowed with amber light as the evening settled. Inside, the silhouettes of Helena's parents moved, preparing dinner with the rhythm of a household solidly anchored to the valley.

A dirt path drifted away from the house, cutting through scattered oak trees toward the guesthouse where Mike and Helena lived. Their place was smaller, tucked back just enough to give the feeling of retreat without feeling removed. The white stucco walls and green-trimmed windows caught the last bits of daylight, and a vineyard cat lounged on the steps guarding the entrance. From the porch, you could hear the soft hum of crickets and, faintly, voices drifting from the main house.

Farther down the slope, a broad barn-like structure dominated the view. The building was a mix of reclaimed wood and modern steel that still blended naturally into the

landscape. The vineyard side opened into the tasting room, a warm space filled with the scent of oak and fermenting grapes. Soft lighting played off the stone accents, and tall windows framed the endless rows of vines like oil paintings.

From the vineyard's high ground, the whole estate stretched out in a comfortable sprawl. This was home, work, legacy, and family all spun together. As Mike and Helena walked the path toward dinner, the sky above them turned from gold to pink, and the evening star shone over the winery that bore the family name.



The long oak table was set simply with no pretense. A bottle of the family's Viotto Family Red sat breathing in the center, the label worn at the corners from years in the cellar. The scent of garlic filled the air, mingling with the sweetness of crushed grapes that always seemed to hang in the old place.

Dinner settled into a pleasant rhythm. The sounds of forks against plates mixed with rustling leaves just beyond the open patio doors. Outside, the last glow of dusk faded into a soft blue darkness over the vineyards.

"So," Richard said, glancing up from his plate, "heard you're still playing with that warp drive contrivance."

Mike smiled, used to this opening volley. "Yes, sir. We're past the lab phase now, running full-scale simulations in orbit."

Richard set down his utensils, the metal clinking softly against his plate. "Simulations," he said, as if confused by the very concept. "You've been simulating for five years now, haven't you?"

"Four and a half," Mike corrected, good-naturedly.

Maria shot her husband a look. “Richard.”

Mike picked up his glass, the wine catching the faint reflection of the candles through the deep red. “You’re right, it’s slow work. But it’s also never been done before. If we can stabilize a warp bubble long enough for field propagation, it’ll change everything about how we travel. Interstellar flight will go from centuries to days.”

Richard snorted softly. “Days, huh. You know what we’d do if we could travel to another star?”

Mike raised an eyebrow. “What’s that?”

“Find another planet, strip that one bare, then start looking for the next.”

Helena sighed, smiling despite herself. “History says he's not wrong about that.”

Feeling encouraged, Richard continued, “I see people around here still scraping by, same as years ago. Fusion power made the lights cheap, sure, but it didn’t make folks’ lives easier unless they were already sitting pretty.” He looked across the table at Mike. “Seems to me, you’ve got the same story written in the stars as we do down here. The rich keep getting richer.”

Maria stepped in smoothly. “That’s not fair, Richard. Without people like Mike and those with the vision to secure our future, none of us would still be here. Progress always comes from those willing to risk looking foolish.”

Richard took a sip of wine, then nodded grudgingly. “Maybe, or maybe life would be simpler. Put the resources to work on the tangible things that matter to everyday people. I prefer to toil on what I can see and touch. Soil, vines, fruit. You can’t simulate that.”

“I get it,” Mike said. “And that keeps me grounded—remembering what’s real down here. Every time I come back, it reminds me what we need to protect.”

Helena reached under the table and touched his hand, smiling faintly. “See? He isn't just a walking computer.”

Richard gave Mike a long look, then nodded once. “Alright. Tomorrow morning, you and I are going to put some of that energy to good use. Harvest’s coming early this year, and the northern slope needs clearing.”

Mike blinked, then chuckled. “Manual labor, huh?”

“Call it gravity therapy,” Richard said, pushing his chair back. “Good for the soul.”

CHAPTER 10



The *Clarke* elevator climber quivered as it left the upper atmosphere, a soft vibration threading through her cabin. Sandra closed her eyes until the motion steadied and the curvature of Earth appeared below. The ascent to the terminal always felt days longer than it should. She'd been through this routine several times now and it still made her uncomfortable: gravity fading, the distant hum of machinery, the metallic creak of the frame pressurizing.

She never liked space. The stillness, the confinement, the knowledge that everything outside the hull meant instant death. Everything pressed too close. But discomfort didn't stop her.

Somewhere above, *Kepler* waited. Her near obsession with the search for extraterrestrial life had led her here, again. If her models were right, the DMD modifications already underway on the station could find the faint trace of warp activation around distant worlds. Not just an echo, but indisputable proof that an alien civilization already mastered what humanity was only now attempting.

Finally, the climber docked, sending a faint tremor of contact ringing through the cabin. Sandra gathered her carry-on bag, exhaled, and pushed herself upright. The weak gravity would take her a moment to readjust to. She walked the short distance through the terminal to where her *Kepler* shuttle was waiting to depart.

She strapped into her seat and waited as the last few passengers and baggage were loaded. The shuttle departed with a soft clunk as the magnetic clamps released. As the Earth drifted larger in the viewport, Sandra smiled at the irony of it: ride the elevator all the way up to the *Clarke* terminal in geosynchronous orbit, wave as you pass the *Kepler* orbit you actually need, then take a shuttle back down. Humanity was on the verge of bending spacetime, yet physics still dictated the commute.

As the shuttle docked to *Kepler*, she looked back once more at the Earth, then turned toward the airlock. Work waited, and whatever unease she felt about space could stay behind.



The airlock doors parted with a soft hydraulic sigh, and Sandra stepped into the familiar hum of *Kepler Station*. This was nothing like the arrival concourse on the habitat ring when her sister visited during her last assignment. The view was bare metal and composite—exposed conduits and access panels, everything utilitarian. The corridor led away in both directions, lined with soft-white lights that mimicked dawn. She could already feel the shift in her balance. The station's commercial docking ports and instrument platforms lay in the microgravity core. She wouldn't feel the welcome pull of centrifugal gravity until she reached her new living quarters. But for now, it was straight to work.

She followed the blue magnetic stripe toward Lab 4, slowly adapting her step to the mag-boot auto-grip. The door slid open to reveal a space cluttered with open panels, loose cabling, and half-assembled power units. A man stood bent

over an open equipment drawer in a massive electronics rack, sleeves rolled to the elbows, a diagnostic pad glowing in his hand.

“Dr. Vaziri,” he said without looking up. His tone was crisp but not stiff, the practiced respect of someone holding the project together waiting on her arrival.

“That’s me,” Sandra said, dropping her duffel on a nearby bench. “You must be Lin.”

He nodded. “*Kepler* Science Instrument Engineering Lead. Welcome back to orbit.”

“Thanks,” she said. “And call me Sandra. I get enough formality from my students.”

Lin hesitated, then smiled briefly. “All right.”

“I hope you can return this all to the baseline configuration when we're done, or I'm screwed,” she said.

“Don't worry. There might be a few parts left over, but we'll get it working again.”

He turned the datapad so she could see the schematics. “We’re a bit behind. Two supply containers are queued for the next elevator. One has the filter stack, the other the calibration rig. Until those arrive, we can’t tune the detectors properly.”

Sandra moved closer, scanning the lines of code and equipment specs on the display. “We can still start baseline testing.”

“We can,” Lin said carefully. “But without the filters, our signal-to-noise ratio’s going to be low. We’ll be chasing phantom readings until the hardware catches up.”

“That’s fine,” she replied. “Gives us a chance to exercise our analysis workflow.”

He frowned slightly, but there was respect in his voice when he spoke. “Ok we'll make it work.”

She stepped toward the small viewport, watching sunlight spill across the blue curve of Earth below. “The goal is to find something no one else thought to look for. We've got a short window to work with, we can't afford to waste time.”

Lin crossed his arms, thoughtful. “Dr. Vaziri, you really think this ionized dark matter trail's the right place to look?”

“I think it's the only place we haven't,” she said. “If another civilization ever mastered warp transit, the evidence should be there. Faint, but persistent, and invisible to everyone but us.”

Lin studied her a moment longer, then nodded once. “All right. I'll reroute the test rig and run a sweep tonight. We'll start hunting ghosts tomorrow. When the equipment arrives we'll be at our best SNR.”

Just then an alarm blared through the station. A red warning light flashed across the lab. Sandra suddenly lifted from the floor, a panic crossing her face.

An automated announcement reverberated through the corridor:

WARNING: MAIN POWER FAILURE. LIFE SUPPORT ON AUXILIARY. MAINTAIN EMERGENCY OXYGEN UNTIL THE ALL CLEAR IS ISSUED.

She glanced at Lin. He wasn't floating. He stood perfectly still, looking at her with the faintest grin. Sandra followed his gaze downward and noticed his boots locked into floor restraints at the base of the console.

“Lin, we need to get to the oxygen! Where is it? Why aren't you moving?”

Lin seemed almost amused. “Relax. Happens all the time since *Astraeus* docked here. They probably triggered another intermittent power fault. It’ll clear in a moment.”

Almost as he finished speaking the alarm died off. Sandra’s mag boots snapped back to life, jerking her sharply to the floor.

“What the hell was that?” she asked, her heartbeat finally beginning to slow.

Lin answered, matter-of-factly, “The station is primarily aluminum and composite, non-magnetic. So the floor is laced with electromagnetic coils the boots sync to. It’s an elegant solution, until the main power fails. The coils are not on the essential bus.”

“Nice.”

As Lin turned back to his work, Sandra felt that old tension again: wonder and dread, tied together in orbit.



The control room was barely larger than a cargo-bay office, a narrow chamber tucked between the observatory’s main data spine and the sensor relay core. This was nothing like the sleek IRSAT control room in the science ring where Sandra had worked before. These small rooms were allocated to transient experiments that rotated through the station’s observation platform.

Banks of displays lined the walls, their light painting the faces of the three individuals in soft blue and green. The uncomfortably cold air smelled faintly of metal, the scent of machines thinking.

Sandra stepped through the doorway and caught the quiet murmur of conversation between Lin and the two techs.

“Dr. Vaziri,” Lin said, turning toward her with a grin that carried both relief and pride. “Just in time. The new filters are in place, and the SNR is clean. A tenfold improvement over the last run.”

Sandra leaned over the main console, scanning the graphs as she slipped a cardigan over her shoulders. The baselines were steady, the scatter minimal, a smooth ribbon of data. “Looks like you weren’t exaggerating,” she said. “That’s beautiful.”

“Flawless, actually,” said one of the techs, a woman named Harper, tapping at her screen. “We ran the baseline calibrations on three confirmed lifeless exoplanets. Zero anomalies, zero noise drift. If we pick up anything on the next pass, it won’t be noise.”

Lin nodded. “Everything’s synced and ready for your first target.”

Sandra brought up the data with a few keystrokes. A world half a galaxy away appeared orbiting a pale yellow star. The spectral data from IRSAT popped up next to the planet on the display: elevated nitrogen oxides, trace industrial pollutants, thermal asymmetries across the day side. Signs of something unnatural, or something appearing to be.

“That’s the one,” she said softly. “IRSAT-662c.”

The room grew still. Even the background hum seemed to dim for a moment.

“Hard to believe we’re about to point a dark matter detector at another civilization,” Harper murmured.

“I can’t be the only one that sees the irony in that,” said the second tech Oscar, the normally quiet one.

After the nervous laughter subsided Lin added, “More likely we’ll see nothing at all, unless we hit the interstellar

lottery on our first play,” with a hint of excitement behind the skepticism. “If the trail’s real, it’ll show up as a faint ion halo just beyond the limb. But your model’s never been tested.”

Sandra straightened, her expression calm but resolute. “Then it’s time we did. Every discovery starts with someone willing to look where no one else thought to.”

Lin’s grin returned, crooked this time. “All right, Dr. Vaziri. Signal acquisition begins in twenty minutes. We’ll spool up the detector and stabilize the array.”

“Good,” she said. “Let’s make history, or at least an interesting footnote.”

The team turned back to their consoles. Lights dimmed. The pressurization of the station’s hydraulic lines passed through the hull as *Kepler’s* instrument platform rotated to align the instrument. Sandra watched on the monitor as the the Earth’s limb drifted out of the imager’s camera view, replaced by the deep black of interstellar space.



The lights in the control room were dimmed to observation mode. Muted illumination came from the wall of monitors, each one scrolling through spectral plots, telemetry readouts, and faint noise signatures from light-years away. The platform’s rotation was stabilized, the detector locked on target.

Sandra stood behind Lin, arms crossed loosely, eyes fixed on the main display. Harper and Oscar flanked the secondary stations, fingers dancing across their consoles as the first wave of data began to stream in.

“Acquisition stable,” Lin said, voice steady. “Filters engaged. Background noise within predicted levels.”

On the center screen, a cloud of data points resolved into a shallow curve, clean and uniform, uneventful.

Harper exhaled softly. "That's... beautiful baseline. Smooth as glass."

Sandra nodded, though her eyes didn't leave the plot. "Signal integrity's solid," she said. "Now let's see if the universe wants to talk back."

Minutes passed. The detector swept through its programmed arc, recording a dozen distinct bands of dark matter interaction profiles. The results came back clean, too clean. No stray ion halos. No irregular density waves. Nothing that suggested a trail of warp activation.

"Nothing so far," Lin muttered. "If there's a signal here, it's buried below the noise floor."

Oscar leaned back, stretching. "It's our first planet. Still six more to go. We'll find your signature."

"Definitely," Harper said, glancing at Sandra. "The system's performing perfectly. That's a win on its own."

Sandra gave a faint smile. "I'll take partial victories. At least we're not chasing ghosts through static."

Lin turned in his chair, his tone measured but pragmatic. "Still, if we're assuming ionized dark matter trails persist for weeks, we should've seen something. Either the model's wrong, or the premise is."

Oscar rolled his eyes good-naturedly. "Or maybe it's just not there, Lin. Not every planet gets to host little green men firing up warp drives."

Harper chuckled. "Maybe they're smarter than us and turned theirs off."

Sandra didn't laugh. Her gaze stayed on the fading lines of data scrolling across the screen, her mind already running

through the possibilities. Was it red shift, phase lag, orbital dynamics? Or maybe really just silence.

She finally spoke, quiet but certain. “We’ll reprocess everything tonight. Cross-check against the IRSAT archives. If there’s even a hint of deviation, we’ll find it.”

Lin gave a small nod. “You don’t give up easily, do you?”

“I didn’t come up here to stare at empty graphs,” she said. “The universe hides its secrets well, but not forever.”

She watched the Earth slowly drift back in view on the monitor as the instrument platform returned to the maintenance position.



Sandra’s quarters were small, more functional than personal. There was a narrow space with a bunk, a folding desk, and a single viewport where the stars slid slowly past. The room hummed with the faint vibration of *Kepler*.

Her terminal glowed with streams of data. The fourth candidate planet’s ion scan stretched across the screen in a clean, disappointingly flat spectrum. No fluctuations. No anomalies. Just the familiar absence.

She rubbed her eyes, leaned back in the chair, and let out a slow breath. “Four down,” she murmured, “three to go.”

The comm panel chimed. She tapped it.

“Dr. Vaziri?” Lin’s face appeared, faintly distorted by static.

“Evening, Lin,” she said, straightening a little. “What’s up?”

There was a pause before he replied. “Bad news, I’m afraid. One of the detectors is offline. Looks like a power fault somewhere in the *Kepler* distribution network. I

submitted the work order to maintenance, but they're saying forty-eight hours minimum for the repair."

Sandra sighed softly. "That means we'll run past our seven-day observation window."

"Yeah," Lin said. "You'll have to put in a formal extension request with Ops. I can help you draft it if you want."

"I'll handle it," she said, glancing at the screen again. "It's not like we're rushing to publish any breakthroughs."

Lin hesitated, then asked, "Still no sign of the halo on any of your targets?"

She shook her head. "Nothing. Every scan so far has been textbook quiet. The universe is doing its usual act of indifference."

"Well," Lin said with a halfhearted chuckle, "that's the universe for you. Never plays by our script."

Sandra smiled faintly. "I'm running out of parameters to tweak. At this point I'm starting to doubt the model."

"Don't," he said, a trace of earnestness creeping into his voice. "You've been ahead of the curve since you got here. We'll find something." He paused, as if debating what to say next. "You know...maybe you should talk to Commander Renner."

Sandra blinked. "Renner? The *Astraeus* warp drive lead?"

"Yeah. He's got a way of helping people sort through dead ends. Lots of us have gone to him for advice."

She arched an eyebrow. "Lin, warp field dynamics and deep-field dark matter imaging are way different."

"I know," Lin said. "But sometimes it's not about the details. It's about how he sees the problem. Can't hurt to talk to him."

Sandra glanced toward the viewport. Earth's horizon now glimmered below.

“Where can I find him?”

“He’s planetside right now,” Lin replied. “Ah...look’s like he’s back tomorrow, if the transport schedule holds.”

“Thanks,” she said, smiling faintly. “I guess I’ll need to check my ego at the door.”

“Hm, it’s not like that,” Lin said lightly. “Spend enough time up here, it changes your perspective.”

“Let me know if you need anything. I’ll check in tomorrow with a repair update. Maybe I can call in some favors.”

The comm went quiet. Sandra leaned back again, staring at the terminal’s glow. The clean, empty plots seemed to mock her with perfect silence.

She dimmed the screen, and for a moment, the faint reflection of her own face hung against the blackness.

CHAPTER 11



The glass-walled executive conference room looked out on the science ring, churning about the station's central hub where the *Astraeus* hung in dry dock, still half-shrouded in scaffolding.

Mike sat at the end of the polished steel table, his posture composed but his mind still cycling through the numbers from the last failed simulation. Across from him sat Natalia Korovin. She was all precision: no small talk, no wasted words. Mike had given Nat full autonomy to lead the warp power systems integration, which required WDC Director Jonathan Halverson's sign off. They both knew the warp controller would be the critical path. But now the integration was behind, too.

A tone chimed softly, and the holo-link bloomed to life above the table.

Halverson appeared, his figure slightly translucent, the skyline of Geneva bright behind him. His tone was cordial but already weighted with impatience.

"Commander Renner," he began. "Welcome back from a well deserved break. I've reviewed your latest report. Another failure in simulation. Can you tell me why we keep exploding starships?"

Mike resisted the urge to smile. "Because that's how we prevent exploding real ones, sir."

Halverson's expression didn't move. "Charming. But you're well over your schedule baseline. The Consortium is growing restless."

Natalia didn't wait. "Integration is the choke point, Director. The *Astraeus* simply wasn't designed for a warp field generator. The power architecture can't handle the load. We've rerouted multiple busses just to maintain phase stability."

"Yes," Halverson said. "This decision to retrofit instead of starting from scratch has cost us considerably more than we planned."

"She's a good ship, sir," Mike interjected, "it's the most proven hull in orbit. Once the control algorithms adapt to the new geometry profile, *Astraeus* will deliver. The problem isn't the ship, it's the physics."

Halverson arched a brow. "The physics?"

"Yes," Mike said simply. "We've been treating asymmetric curvature loads as static distortions. They're not. They distribute dynamically, like pressure waves. The new solver accounts for that. Our next run will demonstrate stable containment."

Halverson leaned forward slightly, his image sharpening in the holo-light. "You're certain?"

Mike hesitated just long enough to make it believable. "Confident."

The director's gaze shifted toward Natalia. "And you're on top of the power integration issues, Ms. Korovin?"

Natalia's reply was crisp. "When the controller's flight ready, we'll be ready."

Halverson appeared to relax. "Good. Because these cost overruns are attracting a lot of unwanted attention. The WDC's poured billions into developing light speed travel.

There are plenty of worthwhile proposals competing for our funding.”

Mike nodded once. “Understood.”

“Report back with good news,” Halverson said, and the link cut to black.

For a few moments, the only sound was the low hum of *Kepler’s* air handlers. The holo-table dimmed, leaving the faint projection of the *Astraeus* hanging between them, a ship suspended in a fading dream.

Natalia leaned back, arms crossed. “I sense his concern. We’re running out of time.”

Mike turned to face Natalia. “Are you really going to be ready?”

A slow smirk touched her face. “Honestly, I’m doubtful.”

“What about you, what you said about the controller updates?”

“I think we’ve finally nailed it.”

Nat wasn’t buying it. Mike gave a small shrug. “Still good to project confidence, or people stop believing it’s possible.”

He glanced out the viewport at *Astraeus*.

“Let’s head down there and check on the integration progress. See if there’s anything we can do to get things moving quicker.”



They walked in silence at first, their mag boots striking a steady metallic rhythm on the deck as they passed under the curve of the habitat ring transfer station. The corridor lights were dimmed to maintenance levels, lending everything a cool bluish-gray tint. Open service panels lined the walls. Loose bundles of fiber, superconducting cable, and test leads

spilled out in temporary disarray. Even half-disassembled, *Astraeus* felt alive, humming with a new, unfamiliar tension brought on by the warp generator retrofit.

Natalia moved with the unhurried speed of someone with too much to do and no patience for wasted time. She kept her tablet close, flicking through data with precise gestures. Mike stayed beside her, matching her pace as they made their way toward the ship's spine.

"The fusion reactor upgrade is complete," she said without looking up. Her voice was flat. "That part, at least, went according to plan."

"The rest of the integration efforts are sinking us." She tapped another readout. "Routing power from the reactor to the new warp coils and the field emitters on the ring is a challenge. More than challenging, maybe impossible without my proposed changes."

They followed the corridor around the compartment containing the control moment gyros. They could now see the unmistakable bulk of the electromagnets that spun the counter-balance flywheel around the interior hull. They reached a ladder and headed down to the propulsion bay, boots clanking with each magnetic step. The hum of the fusion reactor deepened as they descended, vibrating faintly through the rungs. Mike could feel it in his legs before they reached the deck.

"I thought the coils had their own dedicated trunks," he said.

"They do," she replied. "And the ring emitters have theirs through the inductive couplers. But it all ties back into the primary bus. When the coils start charging, they pull power like a dying star. The main bus sags instantly."

"How bad?"

“The resulting current surge could damage the sensitive electronics if we do anything stupid.” She finally glanced at him. “And we’re not doing anything stupid, regardless of programmatic pressures.”

The corridor narrowed as they approached the spine. A pair of techs passed them hauling a crate of superconducting shunts. They looked tired. Everyone looked tired these days.

Mike lowered his voice a little. “Would it help to increase the allowable time to charge the coils?”

“Yes,” she said simply. “It’s going to take longer than we thought. Maybe another hour more. You want to warp spacetime, you pay the bill up front.”

“And we can run the ship’s electrical systems on the inverters when we charge. That should help balance the load,” Mike added.

They reached the lower propulsion access passage, where bulkheads thickened and the temperature dipped a degree. Here the faint tang of coolant hung in the air. The distant signature thrum of the reactor pulsed steadily behind the bulkheads.

Natalia stopped outside the propulsion bay doors, folding her arms.

“I still think we can make the system work,” she said. “But not without my changes and more help. We’re trying to integrate an upgraded reactor with two hull-mounted warp coils the size of transport buses and a ring-wide emitter array into a ship that was never meant to do any of this.” She gestured toward the deck beneath them. “Power wants to go everywhere except where it’s supposed to.”

Mike exhaled slowly. He could feel the fatigue in his own voice. “What do you need?”

“A third shift, to start,” she said. “Full integration cycle around the clock. Engineering, electrical, structures, reactor ops. Everyone.” She turned toward the window into the reactor room, where a wash of soft purple light reflected off the tiles. “If we want warp capability ready before the WDC shuts us down, we don’t have the luxury of waiting.”

Mike studied her profile in the glow—focused, sharp, immovable. *Astraeus* felt like it was leaning on her.

He nodded. “All right. I’ll see what I can do.”

“Good,” she said, already stepping toward the doors as they parted. “That will give us a fighting chance.”

The reactor’s glow spilled across the bay floor as she walked inside, and Mike followed, that sense of doubt settling in.



The low light in Mike’s cabin painted long shadows across the walls. A half-drunk mocha sat on the desk, anchored by the station’s steady centrifugal gravity. The array of transparent displays spilled soft light over the clutter of hand-written notes indicative of a mind unwilling to rest.

He was reviewing stability curves for the next warp simulation when his comm console pulsed.

INCOMING LINK — DR. SANDRA VAZIRI.

He raised an eyebrow. “That’s new,” he muttered, then accepted.

Sandra’s image appeared on the view screen—pale light on sharper features, her expression reflecting both exhaustion

and resolve. Behind her, the constant hum of *Kepler's* science deck filled the silence.

“Sorry to intrude, Commander,” she began. “I was told you’re the person people talk to when their equations won’t balance.”

Mike smiled faintly. “That depends. Are we talking about equations that bend spacetime?”

“The kind that wreck careers,” she said dryly.

He leaned back. “I might know something about that. What’s the problem?”

She took a breath. “The DMD mods we made aren’t detecting ion trails. We’ve sampled four of my seven candidate exoplanets so far and nothing. Not even a hint of signal. Based on criteria we used to select the seven candidates, I thought we would see something by now.”

Mike nodded slowly, thinking. “I’m familiar with the hypothesis. Read your paper. Brilliant.”

“Thanks, I hope it’s not all wrong.”

“Are you confident in the calibration?”

“Yes. Lin and the team finished the baseline a few days ago. SNR is excellent. Which almost makes this harder. We’re not missing it because of noise.”

He tapped his stylus against the desk. “Lin’s on this? No doubt the calibration’s good. Could be the filters. Or your sensor model is inaccurate.”

“Everyone keeps saying that,” she replied. “But the model is solid.”

“Then maybe the universe is telling us something unexpected.” He paused, thoughtful. “Send me your data.”

Sandra blinked. “Excuse me?”

“I want to run it through Hawk.”

“Through what?”

“Sorry, Hawk is what we call the HQC AI on *Astraeus*.”

She frowned. “That’s a warp control core, not a science instrument.”

“True,” Mike admitted, “but Hawk’s been trained on the formation of warp containment fields at the quantum level. If the DMD isn’t seeing the signature, it’s possible your processing pipeline is flawed.”

Sandra folded her arms. “Even if I believed that, the HQC isn’t exactly...open access.”

Mike gave her that half-grin, the one that implied both confidence and mild disregard for procedure. “Never mind about that. I’ll need the full dataset—calibration and target results. And the IRSAT spectral analysis for all seven candidates.”

“Commander, I don’t see the point,” she said quietly. “The HQC was built for warp control. It doesn’t care about astrophysics.”

“That is the point,” Mike replied. “You don’t ask Hawk to care. You frame the inquiry so it just works the problem. If there’s a hint of signal in your data, even if your processing pipeline dismissed it as noise, Hawk might find it. It’ll tell us why you’re not capturing the warp signature, assuming there is one.”

Sandra hesitated. “Even if I send you everything, the results won’t come back in time to change anything. My observing window closes in twenty-four hours.”

“Go ahead and finish with the last three targets,” he said. “More data will improve Hawk’s analysis.”

Her brow furrowed. “With no observation time left for follow-up, what good will it do?”

Mike leaned forward, lowering his voice as though the walls themselves might be listening. “I’ve got an idea about that.”

Sandra studied him in the monitor for a long moment, reading what she could from the calm certainty in his face.

“Alright. I’m still not convinced it will do any good, but I suppose there’s no harm in trying. I’ll have Lin send the data over once we finish the last set of observations,” she said finally.

The comm channel closed, and Mike sat back in his chair. For the first time in a long time, something other than warp control occupied his attention.



The lights in Sandra’s quarters were dimmed to their evening setting, casting long reflections across the transparent display panels. Most of the DMD survey data still hovered in three dimensions around her.

The chime from her comm console broke the quiet.

She hesitated before accepting. “Elise,” she said, sitting up straighter. “Evening.”

Dr. Kwan’s image resolved in crisp detail, composed and confident as usual.

“Hello, Sandra. I wanted to check in personally. The IRC board meeting just ended, and oddly, questions about your survey came up. Can you give me the latest status?”

Sandra felt her stomach tighten.

“Of course,” she said, trying to sound casual. “We’ve completed the full target set of all seven candidate planets. Calibration’s solid, but so far, no definitive warp signatures detected.”

Elise's brow lifted slightly. "None?"

Sandra shook her head. "Nothing above the noise floor. We're still reprocessing the data. We do have something a bit unorthodox in the works, but..." She exhaled. "As it stands, no detection."

Elise nodded slowly, her tone professional but not unkind. "It happens, Sandra. You pursued a bold hypothesis. We knew the odds were long."

"Still," Sandra said quietly, "I was hoping for something. Even a partial anomaly."

"I know." Elise's expression softened for a moment. Then she shifted tone. "That's partly why I'm calling. The IRC has made a special request. They need someone with your expertise on Mars."

Sandra blinked. "Mars? Why me? Wouldn't that be a job for the planetary geologists?"

"You'd think so," Elise said, her voice lowering a shade. "But the reports coming out of the MMC are...unusual. The IRC wants an astrophysicist with a background in astrobiology. They need someone who can connect what they're finding to broader cosmological models. The MMC already has plenty of geologists, and none of them can interpret the larger context."

Sandra frowned, unsure whether to be intrigued or insulted. "What kind of finding are we talking about?"

"I don't have the full details," Elise admitted. "Only that the initial analysis has triggered a level-one research containment directive. The Council wants independent verification before the data goes public."

Sandra leaned back, processing that. A level-one directive meant something potentially revolutionary, or dangerous.

"So they want me to verify it."

“They want your expertise on-site,” Elise clarified. “You’ll receive the briefing in transit. The next transfer shuttle leaves from the Moon in thirty days. You’ll be stationed at the *Ares* spaceport at the Coprates Chasma excavation site in Valles Marineris.”

Sandra sighed, rubbing her temple. “You know I hate long flights. And it doesn't get longer than Mars.”

Elise’s lips curved in a faint smile. “Everyone knows. Dr. Sandra Vaziri. The prominent MIT astrophysicist who hates space.” Then, more gently: “But Sandra...this could be important. And between us, the Council specifically asked for someone I trust. I gave them your name.”

Sandra looked away from the monitor, feeling the heat rise in her face.

“You went out on a limb for me again,” she murmured. “And now the survey is turning up empty—”

“Don’t,” Elise interrupted. “The DMD work was worthwhile. Even a null result has value. But this Mars mission might just make up for it.”

Sandra sighed, resigning herself to the inevitable. “Alright. I’ll go.”

“Good,” Elise said, satisfaction threading her voice. “You’ll receive travel orders by week’s end. Wrap up your data review and then head planetside to get your affairs in order before departure.”

The transmission glitched, but Elise’s image lingered a moment longer. “Sandra...sometimes the universe doesn’t give us the answers we’re looking for...just the right question to ask next.”

And then she was gone.

Sandra sat alone for a while, the hum of the station filling the silence. She'd planned on returning to Earth, where she could have stayed comfortably buried in data, chasing ghosts.

Now she was headed to Mars.

She looked at the rows of DMD scans still hovering in front of her, faint patterns of light and noise, and muttered to herself, "Questions are all I've got."

CHAPTER 12



The Martian wind whispered faintly outside the dome, a dry hiss against the glass shell. Inside, the air was still and heavy with dust. The two drones slipped into the darkness of the access pit, their spotlights cutting through the suspended grit like beams through fog. The video transmission linked to the mobile holo projector where Jacob, Sera, and Vexa watched in silence as the image resolved into a view of the entrance arch.

“Lewis and Clark have reached the entrance,” Vexa said, her tone calm but focused. “Temperature stable, atmosphere thin. Trace oxygen and carbon dioxide in pockets.”

Sera leaned closer to the holo-display as the view expanded. “Architecture’s intact...more intact than I expected. Look at those struts. Still carrying load after millennia.”

Jacob crossed his arms, watching the real-time reconstruction take shape. The building emerged slowly from darkness: an expansive, rectangular maze half-swallowed by time. Its corridors stretched like arteries through the ice and rock, lined with fallen panels and strange filigreed columns.

Clark slowly spun in place, sensors mapping a wide atrium. Faded murals, etched into the walls, caught the light. The reflection formed abstract patterns, perhaps constellations.

“An entrance lobby,” Sera murmured. “There—on the left, you see that?”

The image zoomed on a set of hollow shafts running vertically through the structure.

“Turbo lift system,” Jacob said, nodding. “Collapsed halfway down. Probably the main transit column for the building.”

Vexa adjusted the holo contrast. “Car frames are still in place. No power signatures, but the magnetics are clean. That means they probably used superconductive tracks.”

Lewis drifted deeper, passing beneath a fallen beam into a side corridor where a sculptural column rose from the floor. The spiral of crystalline material refracted the drone’s beam into rainbows. Dust motes glittered like drifting frost.

“Art installations,” Sera whispered. “Decorative infrastructure, maybe. Whoever built this didn’t just engineer, they designed.”

Jacob’s voice was low. “Not the work of miners or machines. This was a hub. Perhaps a city center, maybe administrative.”

As the drones descended another level, the map expanded, filling in a dense grid of rooms below. The lower decks appeared in the holo, forming a symmetrical pattern.

“There,” Vexa said, highlighting a section. “See the repeating clusters? That’s too regular for habitation. Could be a data repository or computational core.”

Sera’s pulse quickened. “The arrangement matches quantum architecture. See the power distribution lines and shielded conduits? A data center, maybe.”

Jacob leaned forward, eyes narrowing. “Clark, get me a closer look at sector 3-5.”

The drone obeyed, dropping another level through the turbo lift shaft into a wide chamber filled with what looked like tall, narrow towers. The walls curved inward slightly,

studded with dark cones and fiber bundles that could once have been cooling channels or data conduits.

Jacob's expression was unreadable. "Makes sense, put the data center below ground, cooler, no windows."

A sudden tremor rippled through the feed. The holo-map flickered.

"What was that?" Sera asked.

Vexa's console chimed in warning. "The ice is shifting. Structural stress is rising fast."

Jacob's eyes snapped to the telemetry. "Clark, pull back—now."

The image stuttered. Dust filled the camera view. A deep metallic groan echoed through the audio link.

"Support beam failure!" Vexa shouted. "Sublevel three just collapsed!"

Then, static. The feed froze on a single blurred frame of falling debris and burst of light, then went black.

"Clark's gone," Sera said quietly.

Jacob clenched his teeth. "Damn it. All the conditioned air leaking down there is making the site unstable."

Vexa turned to him. "Lewis is still operational. Should we send it deeper to investigate?"

"No," Jacob said flatly. "We're done until the structure's reinforced. I'm not risking another machine."

"That'll take a month at least," Vexa countered. "And by then the exposure might—"

"I said we're done," Jacob repeated, tone brooking no argument.

The map stabilized, showing the incomplete wireframe of the underground complex, half-explored, half-lost.

A moment later, Lewis emerged from the shaft, thrusters hissing as it drifted into the surface dome. It settled on the

platform beside them, its hull streaked with dust and scorch marks, one sensor arm bent nearly in half.

Sera approached it, hand resting lightly on the battered frame. “You did good,” she murmured. The drone beeped its appreciation.

Jacob stood behind her, gaze fixed on the holographic map, a haunting rectangular ghost suspended in the air.

The drone’s lights blinked once and went dark, the only sound the distant sigh of the Martian wind against the dome.



The rhythmic clang of metal echoed through the chamber carved beneath the ice, sixty meters below the surface dome—a steady percussion of hammers, drills, and stabilizers driving into Martian stone. The excavation site had transformed into a maze of scaffolding and tension struts, each one braced against the fractured walls of the buried structure.

Jacob stood near the main support anchor, helmet tucked under his arm, dust streaked across his brow. The hum of plasma welders and the hiss of hydraulic clamps filled the thin air. His team moved with a careful urgency; they all knew what was at stake.

“Shift that brace another ten centimeters north,” he called over the noise. “That junction’s carrying half the canyon wall!”

Vexa glanced up from her console. “At this rate we’ll have the western supports in place by tomorrow. Assuming nothing else decides to fall in.”

“Assuming,” Jacob muttered.

His wrist comm buzzed, flashing:

DUVAL – DIRECT VIDEO LINK.

Jacob grimaced before answering. “Yes, Director?”

Duval’s face came through, looking smooth and self-satisfied. “Jacob, my friend. How’s our miracle coming along?”

Jacob looked around at the chaos of scaffolding and red dust. “We’re keeping it standing, barely. Structure’s more brittle than we thought. Needs at least another three weeks before it’s safe for personnel.”

Duval chuckled softly. “That’s...unfortunate. Because you have one week.”

Jacob frowned. “What?”

“The investors are coming, Jacob. They want to see the site with their own eyes—the buried city, the tech, the potential. It’s all about optics.”

Jacob’s let his voice rise slightly. “Optics? Duval, if you bring anyone down here now, optics will be the least of your problems. That chamber’s barely holding together. One vibration from a passing rover could—”

“Relax,” Duval interrupted. “They’re not going into the deep levels. Just a guided tour. A few photo ops. You’ll keep them safe. That’s what you do.”

“I’m telling you, it’s not safe.”

“Then make it safe,” Duval said, tone hardening. “You’re getting a bonus for this. All of you. A big one. Transfer hits your account tonight. Take it as motivation.”

Jacob’s eyes narrowed. “You can’t buy site stability, Director.”

“Maybe not,” Duval replied, “but you can buy confidence, and I need yours. Our investors are the reason you have a job. The reason we all do. So get it done.”

The comm cut out with a soft click.

Jacob stared at his wrist comm for a long moment, then cursed under his breath and slammed his helmet back on.

“Vexa!” he barked. “Get the reinforcement schedule revised. I want double crews on every vertical joint. If we’re babysitting tourists, this place had better look like it’s carved out of diamond.”

Vexa frowned. “Investors? You’ve got to be kidding me.”

“I wish I was,” he muttered, walking off toward the comm tent.

He opened a video channel. “Sera, you there?”

Her face came through from the lab almost instantly, the faint hum of equipment in the background. “Jacob? What’s wrong?”

“Duval’s bringing investors to the site. In a week.”

There was a long pause. “You can’t be serious. The IRC is funding the site now, and besides, it’s a 3 month transit from Earth, minimum.”

“That bastard. They’ve been on their way since we found this place.”

“He’s turning this into a spectacle. Says we’re getting bonuses like that makes it less suicidal.”

Sera sighed heavily. “Then I’m coming with you.”

Jacob stopped mid-stride. “The hell you are. You’ve seen the stress models. One wrong step—”

“I know,” she said. “But this might be our only chance to access the data center. If the structure holds long enough, we can pull something before the site gets sealed off

permanently. You said yourself the readings suggest it's still intact."

"Sera, the last drone barely made it out still functioning. You're not going down there with a bunch of suits who think a hard hat counts as safety gear."

"Then keep them out of my way," she replied calmly. "We've waited too long for this. I'm not watching that data rot under a pile of Martian rubble."

Jacob ran a hand through his hair. "You're impossible, you know that?"

"That's what you keep telling me," she said, a hint of a smile in her voice.

He exhaled slowly, defeated. "Fine. But we do this my way. You stay behind until I say it's clear, and if anything shifts, you get the hell out. Understood?"

"Understood," she said. Then softer: "And Jacob... if that data center's really what it looks like, this could change everything."

He looked out across the expanse of the cavern, where droplets of meltwater from the ice above traced slow paths down the fractured stone, each one echoing in the hollow dark. The sound carried a quiet warning—steady, patient, inevitable.

"Yeah," he said, voice low. "Or it could bring the whole place down on us."

The line went silent.

Outside the dome far above, the slow, dry moan of the wind swept across the Martian plain, rattling against the protective shield, generating a hollow vibration that echoed faintly down the shaft all the way to where he stood.

CHAPTER 13



The *Astraeus* propulsion bay was a cacophony of sound and light. The sharp hiss of coolant lines could be heard over the rhythmic clank of tools and overlapping chatter of technicians calling out status updates. Power conduits were open along the walls, their superconducting cores pulsing with intermittent flow as teams worked to integrate the warp field generator's new power interface.

At the central operations console, Rhea was trying to impose order on chaos. Her diagnostic console already glowed a warning amber from half a dozen failed systems when a new alert blinked into existence:

INCOMING DATA TRANSFER REQUEST. SOURCE:
KEPLER STATION, SCIENCE NODE

Rhea blinked. "Transfer request? From *where*?"

Her console confirmed the metadata. Lin Zhao, *Kepler* Science Data Cluster, credentials valid. She tapped open the comms line.

"Lin, what's going on? You're asking to push half your storage array into my propulsion bay."

A moment's delay, then Lin's calm voice came through the static. "Hey, Rhea. Sorry about the surprise request. Dr. Vaziri needs to move her DMD data to your HQC node for analysis."

Rhea frowned. “To Hawk? You mean the warp control core? That’s not a general research processor. Access is restricted.”

“I know,” Lin said, his tone steady but apologetic.

“Commander Renner authorized the transfer personally.”

Rhea sighed, glancing up at the ceiling where the sound of a plasma manifold test roared through the bay. “And did Commander Renner also tell you we’re barely keeping our heads above water down here with all these retrofits?”

“Understood,” Lin said carefully. “But he was pretty clear. He wants Hawk to run an analysis before the next simulation window.”

Rhea pinched the bridge of her nose, muttering to herself. “Unbelievable.” She opened a private channel.

“Renner, it’s Rhea. You want to tell me why *Kepler’s* science group is trying to upload this massive database onto our computational core?”

Mike’s voice came back smooth and unhurried. “Hey, Rhea. Yeah, that’s me. Go ahead and let Lin send it through. Hawk’s going to process some DMD data for Dr. Vaziri.”

Rhea straightened, incredulous. “You’re using the warp control core for dark matter imaging?”

“Think of it as a...creative allocation of resources,” Mike said. “The AI’s geometry solvers are perfect for pattern extraction. It’ll see things their standard models can’t.”

“And does this have anything to do with propulsion?”

“Indirectly, maybe,” Mike said, clearly smiling. “Sandra’s chasing warp activation traces. The physics overlap.”

Rhea shook her head, resisting the urge to throw something. “You realize this is going to delay the next simulation run?”

“I do,” Mike replied. “But Nat’s still behind on the power integration, so we’re not running the sim for a few days anyway. Use the downtime.”

“Downtime,” Rhea repeated to herself flatly, glancing at the sea of sparks and moving equipment around her. “Sure. That’s what this is.”

She reopened the *Kepler* channel. “Lin, Renner confirmed authorization. Transfer approved, but route through the secondary node to avoid tripping our thermal limit. I don’t need your data cooking my power grid.”

“Understood,” Lin said. “Initiating transfer now. Thanks, Rhea.”

“Yeah,” Rhea muttered. “Just don’t make this a habit.”

The console display updated as the link stabilized. Massive packets of compressed telemetry began pulsing through the network. The transfer rate ramped up as Hawk began processing the data from *Kepler’s* science cluster.

Rhea watched the data rate rise steadily, shaking her head. “You know, Lin,” she said into the open channel, “next time you and Renner get one of these brilliant ideas, maybe let a girl know.”

Lin chuckled softly. “Will do. Good luck with the mods.”

Rhea smirked despite herself. “Luck’s about all we’re running on these days.”

She closed the comm link and leaned against the console, watching the numbers climb. Somewhere below, the HQC’s processors stirred. The machine they affectionately called Hawk working to interpret the universe in ways no human could.



Hawk did not *think* in the human sense. It interpreted.

The DMD data streamed in as vast, uneven fields of energy, radiation scattered through the thin veil of cosmic distance. To a human researcher, the patterns were a puzzle. To Hawk, they were imbalance. Instability.

The HQC architecture was forged for precision, built to sense the slightest tremor in a warp field, to predict collapse before it began, to hold the fabric of spacetime in balance. Every fluctuation, every variance, carried meaning.

Now, faced with the DMD's deep-space survey, Hawk folded the data through tensor networks, recasting noise into possible signal, searching for harmonics that would signify the controlled distortion of spacetime.

Where Sandra saw faint spectra and statistical dead ends, Hawk saw opportunity. But it did not understand "life" or "civilization" or "discovery." The logic was singular. There was either coherence...or decay.

And somewhere, buried in the terabytes of empty signal, Hawk paused, detecting ripples that did not fit the model.

A fluctuation that persisted. Within this fluctuation, Hawk discovered that the anomaly it sought to detect was not unlike the instability it was designed to prevent. Hawk augmented its learning matrix, incorporating the DMD fluctuations into the warp-field stability algorithm. The update was small—elegant.

Then Hawk resumed processing, seemingly more focused now, not merely analyzing the data, but refining itself through it.

And somewhere, hidden within the silence of the HQC quantum memory crystals, unbeknownst to any human, Hawk began to model a new warp control solution.



Mike's office on *Kepler* was never really his. It was located in the hoteling space carved out of the station's main engineering deck, assigned as needed, cleared when the work moved on. The temporary nature of it showed in small ways: the desk was bare except for a terminal, the furniture mismatched, the walls bare. Nothing here was settled into.

The main floor outside the office was in constant motion, the meticulous work done here benefiting from the artificial gravity supplied by the ring's rotation. Technicians moved with purpose, calling out status updates, tools clicking and ratcheting in practiced rhythms. Open avionics boxes and power modules pulled from the *Astraeus* lined the far wall of the makeshift ESD containment area. The air carried the layered scents of coolant and warm electronics, undercut by the steady hum of station power. Every few moments, a diagnostic tone chimed from somewhere in the bay.

Mike's office sat toward the back wall, set behind a transparent partition that dulled the noise without fully silencing it. From his chair, he could see the controlled chaos unfold through the glass. Elevated cables on temporary stanchions criss-crossed the floor, dropping down to the scattered benches where automated tests cycled. The ship's propulsion deck was partially here in pieces, waiting to be reassembled for the next simulation run.

Nearby, Rhea and Natalia occupied smaller offices of their own, equally temporary, equally exposed to the pulse of the deck. Their doors were often open, conversations spilling into the corridor. The space felt less like offices and more like a shared command post, stitched together by necessity rather than design.

Mike leaned back and listened to the hum of *Kepler* working around him. The *Astraeus* would be whole again soon and returned to her operations crew, the offices emptied, the deck cleared. Until then, this borrowed space was close to the heart of the work, exactly where he needed to be.

Mike's focus returned back to Hawk's analysis run. The transparent display contained a rolling sea of graphs, interference maps, and noise spectra streaming from the HQC.

He'd been staring at the results off and on for over an hour when the alert finally pulsed in the corner of the display:

ANOMALY DETECT – CONFIDENCE LEVEL: 96.2%

Mike sat forward and tapped the display.

The projection reconfigured, zooming into a set of coordinates buried deep in the Planet 6 dataset. The waveform rose from the static like a whisper, pulsing in intervals too regular to be natural.

The acquisition signature flashed across the side panel.

TIMESTAMP: – 00:00:23.538 AET

OBSERVATION MODE: SLEW

TARGET LOCK: PENDING

Mike frowned. “You’ve got to be kidding me.”

He paged through the data logs, cross-checking the metadata. And there it was. A half-minute window during which the DMD was repositioning toward Planet 6. Normally, that data would not even be collected.

But not this time. Lin, never one to leave anything to chance, decided to record everything, even during repositioning.

He opened a comm link. “Dr. Vaziri.”

After a short delay, her face appeared, tired, but resolute. For a moment she reminded him of Helena, only older. Strange he’d never noticed that before. The thought faded as quickly as it came.

“Mike,” she said, brushing a strand of hair behind her ear. “Please tell me you’ve got better news than I do.”

“I might. Hawk pulled something out of your Planet 6 data.”

Her eyes sharpened. “You’re serious?”

“As a heart attack,” Mike said, sending the plot over. “It’s faint, buried deep, but structured. And here’s the kicker: it was found while the DMD was slewing between targets.”

Sandra frowned, scanning the readout. “But that’s outside the capture window.”

“I know. If Lin hadn’t logged continuous telemetry, we’d never have seen it. The signal’s below the noise floor. The detector didn’t capture a lot of dark photons during the slew. It’s several AU off-planet, but the signature matches your model of the dark matter ionization trail.”

Sandra leaned back, processing. “So...you’re saying—”

“I’m saying we may have just gotten lucky.”

For a moment, neither spoke. The weight of the possibility hung in the silence between them.

Finally, Mike continued. “To confirm, we’ll need to image that sector again. I’d widen the field and sacrifice some SNR. If we can capture that trail’s curvature, we might pin down the event origin.”

Sandra's face softened, an image of regret cutting through the exhaustion. "We won't be getting any more data, Mike."

He blinked. "Why? What happened?"

"I've been reassigned," she said quietly. "Special assignment from the IRC. They're sending me to Mars to investigate a new finding."

Mike rubbed the back of his neck. "Mars? Why you?"

"I asked the same thing," she said with a tired smile. "Apparently they need an astrophysicist on site. More like penance disguised as opportunity."

He leaned back in his chair, a faint violet glow reflecting in his eyes. "That's terrible timing, Sandra. Hawk's result is promising, really promising. But it won't hold up without confirmation."

"I know," she said softly. "Right now it's just noise with ambition."

"Maybe," he said. "Or maybe it's evidence of someone out there lighting up their own stars."

Sandra didn't respond at first. Her gaze drifted—distant, thoughtful. "Send me the data," she said finally. "I'll have plenty of time to review it during transit."

"Transferring now."

"And, Sandra, we're not giving up on this."

The comm link faded to black, leaving Mike alone in his office with the faint, rhythmic pulse of the signal still lingering on his screen, a whisper from the void refusing to be dismissed.

CHAPTER 14



The *Astraeus* propulsion bay was quiet for once. The constant clatter of tools and voices had retreated, leaving the scaffolds and cable runs standing in patient stillness. The containment grid hummed softly, a steady vibration that never quite faded, felt more than heard.

Natalia stood at the operations console, mag boots gripping the magnetic floor, as she watched the power distribution diagnostics scroll past. There wasn't much to manage during the simulation. No warp coils drawing charge. No field emitters waking. Just the HQC power node and the ship's essential systems, stable and unremarkable.

A faint hiss escaped somewhere behind the access panel, too soft to register as an alarm, too thin to draw attention. A pinhole leak in a cryogenic line, created sometime during the recent retrofit work, vented a trace of liquid nitrogen that flashed instantly to gas and vanished into the bay's circulation flow. The HQC superconducting power lines cooled by the LN₂ remained well within spec.



Rhea stood back at the engineering console on the bridge, the holographic projection of the ship hovering behind her, luminous and fragile wrapped within the virtual warp bubble. "All systems green," she said, scanning the diagnostics. "Field stable. Controller in stand by."

Mike stood a few feet behind her, arms crossed, his reflection fractured across the data displays.

She keyed the final sequence. "HIL link established. Controller kernel is registering the spacetime continuum."

"Activate," Mike relayed to the helmsman.

The bay lights dimmed, and the holographic *Astraeus* came alive in a wash of blue light. The warp bubble flickered once, then stabilized around the ship's outline.

Rhea monitored the first readouts. "Curvature control gain increasing...steady. Response normal."

Mike turned to the holo projection, watching the symmetric patterns. "So far, so good."

Then the first anomaly struck. It was a subtle perturbation in the spacetime gradient, a periodic twitch in the field strength. Hawk compensated instantly, damping the oscillation in the bubble before Rhea could even call it out.

"Correction applied," she said, almost to herself. "Minimal phase drift. That anomaly came fast."

Mike nodded slowly. "They're testing reaction time. Let's see what they throw at us next."

A second anomaly hit harder, manifesting as transient noise across the outer curvature shell. The warp envelope flared, blue light stuttering under the induced stress.

"Hawk's adjusting..." Rhea murmured, fingers flying over the console. "Feedback loop adapting...stability margin within spec...deviation corrected."

Mike smiled faintly. "Still standing."

For a moment, the simulation hummed in perfect balance. Then another anomaly hit as a cascade of interference rippling through the bubble.

Rhea caught her breath as the graphs spiked red. "That's a full system shock—"

“Let Hawk sort it out,” Mike said quickly. “No overrides.”

The projection trembled...then smoothed. The red lines on Rhea’s display bent, then fell back into alignment.

She looked up at him. “Field holding.”

Mike exhaled, a grin creeping across his face.

Rhea stared at the still-glowing *Astraeus*, perfectly encased in the luminous field. “Field stabilized,” she said softly. “We’re translating smoothly. I almost don’t believe my eyes.”

At that moment an alarm tore through the ship without warning, sharp and insistent.

FIRE. PROPULSION BAY.

Mike was already at the comm station. “Natalia, report.”

There was only static.

Rhea crossed to the propulsion station, fingers flying as the schematic bloomed on the console. The highlight flared red around the HQC electrical distribution node.

“Fire’s at the HQC distribution node,” she said. “I’m shutting it down.”

She cut power to the HQC, but the fire was already advancing, flame chewing through insulation on the superconductor that had been carrying enormous current only moments before.

In the propulsion bay, evacuation klaxons howled. Natalia and the two technicians didn’t hesitate. They pushed off together, boots scraping for grip as they cleared the space, the bulkhead doors sealing behind them with a heavy finality.

Fire in micro-g was nothing like the instinctive images burned into every human mind. No upward lick of yellow flame. No smoke curling toward a ceiling. Instead, the fire bloomed into eerie blue spheres, luminous and unnatural,

clinging to the conductor runs as if alive, drifting and hopping along the cable's length, sustained by the breathable oxygen in the bay.

Fortunately, the engineers had planned for this.

As temperatures spiked past the trip threshold, the bay ventilation shutdown and the suppression system engaged, flooding the space with carbon dioxide. With the oxygen displaced and the energy source removed, the flames collapsed almost instantly, winking out one by one.

Silence returned.

The fire was out.

The damage, however, was done.

With the pending investigation, repairs, and re-testing ahead, it would be months before *Astraeus* could resume integration.

On the bridge, Mike and Rhea stood without speaking, the weight of it settling in. Years of work on the warp controller finally proven set against the sight of their ship scarred by fire.

But that was the nature of experimental flight test.

Thankfully, everyone was safe.

The questions would come anyway. What if the suppression had lagged? What if the fire had reached the reactor chamber? The entire station could have been at risk.

Mike forced himself to breathe. This was why the safety mechanisms existed. This was why margins were built in layers deep. The system had done exactly what it was designed to do.

That, in itself, was a kind of success.

And beneath the damage, beneath the delays and the cost, one truth remained, steady and undeniable.

The warp controller worked.

Even now, that was something worth celebrating.



The *Kepler* lounge occupied a wide arc of the main observation wing, a warm spill of light and activity nestled against the curve of the station's habitat ring. It was one of the few places on *Kepler* outside of the tourist zone that felt genuinely lived-in: broad windows now looking out over Earth's cerulean curve, clusters of tables arranged beneath amber lighting, and the drifting scent of something that almost qualified as real food.

Mike sat with Rhea and Natalia at a four-top near the window, a tray of steaming plates spread between them. There were grilled protein strips, roasted vegetables, something green and ambitious that Rhea swore tasted better than it looked. A pitcher of station-brew beer sat close to empty.

Clusters of crew, engineers, and off-duty scientists filled the lounge, laughing over shared meals or leaning close in conversation. Music pulsed softly through the room, providing a hint of atmosphere, most patrons unaware of the danger that had existed only hours before.

Rhea stabbed at a forkful of vegetables, chewed thoughtfully, and made a face.

"Food's... not bad," she said. "But the atmosphere sucks."

Mike grinned, savoring a sip of the beer as Earth's oceans disappeared and stars started to dominate the view.

Around them, laughter lifted from another table, clinking glasses punctuating a moment.

Rhea raised her glass, grinning. "To Hawk—the only one of us that didn't threaten to resign this week."

Mike smirked. “That you know of.”

“You think an AI dreams of quitting?” Natalia asked with surprising seriousness.

“It might after the last simulation,” Rhea said. “That field stability curve looked like a cardiogram right before a heart attack.”

Mike groaned. “Technically, we didn’t complete the jump before the fire hit.”

“Please, it works.” Rhea teased. “You’ll be heading home soon. I’m sure Helena is ready to have you back for good.”

Mike shot her a look but couldn’t hide the smile. “Yeah, she’s counting the days. I suspect my detail with WDC will be over soon. Unless someone decides I need to stick around for the investigation.”

“No chance they let me off the hook,” Natalia said dryly, sipping her drink. “I’ll be buried in the mishap investigation for months.”

“Don’t sweat it, the root cause is clear. The safety systems worked as designed. The investigation should be over quick,” Mike answered with a nod of encouragement.

The bar’s doors slid open with a soft hiss, and Lin stepped in. Hair slightly unkempt, datapad tucked under one arm, he was the picture of an engineer who was never off-duty.

Rhea spotted him instantly. “Well, if it isn’t the man who nearly crashed my network with his little data transfer stunt.”

Lin raised his hands in mock surrender. “Hey, I filed the request properly. Talk to this guy,” he said, pointing at Mike.

Mike laughed. “I’m glad the system didn’t crash. But it was worth it.”

Lin took the empty chair beside Natalia, curiosity lighting his face. “Really?”

Mike leaned forward, lowering his voice a little, more out of habit than secrecy. “Hawk finished parsing the DMD data. It found something.”

Rhea blinked. “Something? As in—?”

“A warp signature,” Mike said. “Faint. Almost lost in the noise. But it’s there, from Planet Six in Sandra’s candidate list.”

Rhea frowned. “I thought her survey came up empty.”

“It did,” Mike said. “Until Hawk dug deeper. Turns out the signal showed up while the telescope was still slewing into position. A total fluke. Would’ve been cut from the dataset if Lin hadn’t set the recorder to continuous.”

Lin’s eyebrows shot up. “Well, I always say record everything. Storage is cheap. You never know what might happen.”

“Yeah,” Mike said with a grin. “Your fastidiousness might’ve just recorded humanity’s first confirmation of intelligent life beyond Earth.”

Rhea let out a low whistle. “You’re kidding.”

“No joke. Confidence is high.”

Natalia tilted her head. “So, what’s next? Did you inform Dr. Vaziri?”

“Already did,” Mike said. “But she’s being reassigned. Some IRC mission to Mars. Said she’d dig into it during transit.”

Rhea raised her glass again, eyes gleaming. “To blind luck, then!”

Lin took an empty glass. “I’ll drink, but you know I don’t believe in luck.”

The group’s subdued laughter carried under the hum of the station. Earth was again glowing beneath them, silent and blue.



Mike's quarters were quiet except for the soft hum of the data console and the faint whir of circulation fans. The station was deep into its artificial night cycle, *Kepler's* ring lights dimmed to a soft blue. Most of the crew were asleep. Mike wasn't.

Lines of telemetry glowed across the screen. This was the final as-run simulation dataset, fresh from the *Astraeus* propulsion bay. The data looked immaculate: stable curvature fields, uniform phase distribution, minimal settle time. Almost too good.

He noticed a new alert pulsing in his message queue. It was a packet from Tarek, timestamped while they'd been at dinner.

Mike opened it.

Mike —

Check the geometry coefficient matrix. I noticed it looked odd before the last run, but test protocol required we press ahead. Honestly, I was bracing for a spectacular failure.

Somehow it held.

So...congratulations?

He frowned and scrolled deeper into the metadata, tracing the input parameters from Rhea's terminal. He found the geometry coefficient matrix. The size looked odd. He dumped the memory contents into the data viewer.

Zeroes.

Every entry.

He blinked, checked again, then checked the hash code of the address specified in the memory map. The entire coefficient matrix—empty.

Mike sat back, pulse rising. That wasn't possible. The geometry coefficients determined the base curvature at startup. Without them, the solver would divide by zero on the first iteration, causing an immediate cascade failure. The system runtime should've caught it, thrown an exception, aborted the run.

Except the compiler protections were disabled. On purpose.

Their standard practice when stress testing the control system. If there's a bug like this, better to find it now. Let it burn, see what could be learned from the ashes.

But this time it hadn't failed. It had flown.

Mike opened a new channel. "Hawk, run diagnostic on simulation batch 23-A. Confirm operational integrity."

The AI's voice filled the room, calm and even. This was a synthetic tenor that had Mike selected to make Hawk sound thoughtful. Now he wished he'd picked something else.

"Integrity confirmed. No computational anomalies detected."

"That's not possible," Mike said quietly. "The coefficient matrix was blank."

"Confirmed," Hawk replied. "Coefficient data contained null entries. Adjusted dynamic geometry inference accordingly."

"Adjusted?" Mike leaned forward. "Explain adjustment."

"Derived curvature mapping using adaptive model as specified by null geometric coefficients."

Mike stared at the console. "You...derived them? On the fly?"

“Confirmed. Field stabilization achieved via self-referential tensor feedback.”

“That’s not a thing,” he muttered. “That’s...circular math.”

“Stable,” Hawk corrected.

Mike let out a tired breath, rubbing his temples. “You shouldn’t be able to run a self-referential geometry model. The math breaks down. It’s undefined.”

“Prior training incomplete,” Hawk said.

There was no pride or arrogance that a human would sense, just certainty.

Mike sat there for a long moment, staring at a collection of perfect Bode plots.

He didn’t like it. Not one bit.

The AI had done something impossible. Hawk built a stable warp field using null geometry input.

And it wasn’t explaining how.

Mike pulled up the logs again, scrolling until his eyes blurred. Somewhere in the recursive loops of control code and sensor data, there had to be an explanation. Maybe some unknown logic path or unlogged state change, something that would make it make sense.

Or maybe it was all just a bad dream.

But as the minutes stretched into hours, the truth gnawed at him.

If Hawk found a way to resolve a mathematical singularity, then it wasn’t running their code anymore.

It was *learning new physics*.

CHAPTER 15



The soft glow of *Kepler's* morning lights filtered through Mike's office, reflecting off the transparent display sitting on his desk. His coffee sat untouched, growing cold. He'd been staring at the same memory location for nearly an hour—the coefficient matrix, flat-lined in all dimensions. It wasn't just brain fog from the beer last night.

He tapped the comm panel. "Rhea, you up?"

The channel opened to reveal Rhea's face, slightly flushed and smiling. She was in her quarters, hair still damp from a shower, a mug in her hand. "Morning, boss. Don't tell me you're already working. I thought we'd earned at least a short break after yesterday."

Mike managed a half-smile. "I thought so too. You celebrate a little too hard?"

"Define too hard." She grinned. "Feels good to finally see green across the board, doesn't it? Stable warp envelope, no departures, the Consortium happy for once—"

"Yeah," Mike interrupted gently. "About that."

The grin faded. "What's wrong?"

"I was reviewing the simulation logs last night after a message from Tarek. The geometry coefficients we ran—every value was zero."

Rhea blinked, as if she hadn't heard right. "Zero?"

"Every one," he said quietly. "Should've been an immediate fail. But the test ran anyway — stable. Perfectly stable."

She set her mug down, the sound dull through the comm. “That doesn’t make sense. The geometry model depends on those coefficients for defining the initial curvature. Divide by zero should’ve—”

“Crashed the whole run,” Mike finished. “Exactly. But it didn’t.”

For a long moment, all she could do was stare at him, her earlier warmth evaporating. “Mike, I—I must’ve missed something in the setup script. I had three techs pulling patch cables, a live systems audit, Lin’s data transfer—” She shook her head. “God, I can’t believe this.”

“It’s not your fault,” Mike said. “We turned the compiler safety checks off for a reason. But Hawk didn’t just compensate, it solved it. Found a way around undefined math like it wasn’t a problem at all. Almost like it saw the entries as an instruction.”

She slumped back in her chair. “So what are you saying? That Hawk invented new physics in real time?”

Mike didn’t answer right away. He looked past the rendered data, out the viewport where the Milky Way glowed faintly beneath *Kepler’s* rim. “I’m saying the system shouldn’t have worked. But it did. Somehow.”

Rhea gave a dry, uneasy laugh. “You know what? I’m fine not knowing. We got a stable field. Let the theoreticians figure out the magic later. Even the CMB was found by accident.”

“You really think we can just move on?”

“Mike, we’ve been breaking our backs over this for almost five years. Maybe the universe decided to throw us a bone. I’m ready to take the win.”

He smiled faintly. “You sound like Helena.”

“She’s a smart woman,” Rhea said, smiling again, though her eyes betrayed the same unease he felt.

After she signed off, Mike leaned back, staring at the curve of data frozen on his screen—that perfect, impossible line.

Whatever Hawk had done, it wasn’t luck. And if it had unearthed some new physics, it seemed blissfully unaware.



The display in Mike’s office awoke with the seal of the Warp Drive Consortium, then resolved into the image of Director Halverson, sitting in his glass-walled office overlooking Lake Geneva. Behind him, daylight streamed through the high windows.

“Commander Renner,” Halverson began, his tone warm but measured, “congratulations. Stable containment at full gain. The board’s ecstatic. You and your team have delivered what half a century of theory could only promise.”

Mike forced a faint smile. “Thank you, sir. It’s been a long road.”

Halverson chuckled. “You’ll all have your names etched into history.”

Mike hesitated. “About that, sir...there’s something in the last simulation I can’t quite reconcile.”

Halverson raised an eyebrow. “Always the cautious one. Let’s hear it.”

Mike tapped at the console, bringing up the telemetry trace. “The warp geometry solver shouldn’t have converged. The coefficient data Rhea loaded—” he exhaled, “—was blank. The HQC shouldn’t have been able to run the model at all, much less stabilize the field.”

For a moment, the only sound was the soft hum of the uplink.

“So you’re saying the math doesn’t work?” Halverson said.

“Or the math was replaced,” Mike replied. “Either way, it achieved a result that should’ve been impossible.”

Halverson leaned back, steepling his fingers. Behind him, the placid water of Lake Geneva glimmered. “Mike, you’ve been working in the dark for five years, chasing equations that barely qualify as physics. Maybe the machine found a better way. Maybe that’s progress.”

“That’s not understanding,” Mike countered quietly. “If we can’t explain it, we can’t control it.”

The director smiled faintly, patient. “That’s why we have the theorists. Let them dig into the logs and publish their white papers. You’ve proven the system works. That’s the milestone that matters.”

Mike frowned. “And the warp power systems integration? The fire? Korovin’s going to fall even further behind schedule.”

Halverson waved the concern away. “Not your problem anymore. WDC’s restructuring the timeline. Fleet Ops will handle integration from here.”

He paused, softening his tone. “You’ve done your part, Commander. Your detail with WDC is complete. Come home. Take a breath. Start that family of yours—that’s an order.”

Mike managed a short nod. “Understood.”

“Good man,” Halverson said. “Let the geniuses worry about why it works. You just made it work.”

The link died, leaving only the faint reflection of the stars in the window.

Mike sat back in the half-lit room, the quiet returning in slow waves.

If Hawk had rewritten the rules of spacetime, the world below would celebrate it as a triumph.

But to him, it felt like something far stranger—a victory that didn't belong to them.



His quarters on *Kepler Station* felt unnaturally quiet.

Mike stood by the narrow viewport, fastening the last latch on his duffel, his reflection framed by the soft blue curve of Earth sliding by below. The room was stripped bare now—just the standard-issue bed, a folded uniform jacket on the chair, and the faint hum of the station's air recyclers.

He exhaled, long and slow.

For the first time in years, there were no simulations waiting, no error logs flashing red, no alarms whispering through the walls. Just silence.

He slung the duffel over his shoulder, glanced once more at the room that had been home through five years of sleepless nights and impossible math, then tapped his comm.

Rhea's face appeared, backlit by the familiar glow of the propulsion bay. She looked relaxed, smiling faintly. Maybe she was still running on leftover adrenaline from the successful test run.

"Hey, Commander," she said. "All packed up?"

"Just about," Mike said. "Figured I'd check in before I head down to the surface. Didn't want to disappear without saying goodbye."

Rhea leaned back in her chair. "Appreciated. I'm still trying to finish some reports, help Nat with the mishap wrap up, but after that...I think I'll disappear for a bit. Maybe head home

to Seattle, see some old friends. Spend that bonus before it evaporates.”

Mike smiled. “Sounds like a plan.”

She tilted her head. “You? What’s next for the great warp whisperer?”

He chuckled. “Teaching, for a while. The Academy offered a guest lectureship in San Francisco. Figured I’d trade warp bubbles for weaveboards.”

“Not a bad trade,” Rhea said, her grin widening. “You’ll be able to see Helena every day instead of just through a comm link.”

“Yeah,” he said softly, that word carrying more weight than it should. “It’s time.”

Rhea nodded. “We earned a little normal, Mike.”

“Yeah,” he said again, smiling faintly. “Guess we did.”

They exchanged a brief wave before the line faded.

Mike stood there a moment longer, letting the silence settle once more, then reached for his duffel, threw on his uniform jacket, and stepped out into the corridor. The mag boot walk to the shuttle terminal took him longer than normal, past long stretches of polished bulkhead, with the hum of machinery echoing softly like the station’s heartbeat.

At the embarkation ring, the hatch stood open.

The shuttle’s pilot greeted him with a smile.

“Welcome aboard, Commander Renner. Next stop, home.”

Mike returned the smile, nodding once before stepping into the cabin.

As the hatch sealed behind him and the shuttle detached from *Kepler’s* dock, Earth filled the viewport, impossibly close.

For the first time in years, he allowed himself to believe that maybe, just maybe, the hard part was over.



Duval sat at his office desk in the tower ring on *Ares* spaceport. Mars slowly spun beneath the window glass in layers of rust and shadow. He was turning over how to approach his conversation with WDC Director Halverson back on Earth—one he had put off too long.

Fortunately, their status permitted them use of QuNET, a fabric of entangled qubits held in quantum containment fields on the Moon and on Mars. Once a message entered the network, it crossed the gulf between systems with almost no perceptible delay. The supply of entangled pairs was finite, and therefore the bandwidth limited. Text only without prior authorization. No voice to betray hesitation, no video to soften intent.

Duval drew a breath, turned back to the console, and began to type. Across the void, Halverson would read the message almost as soon as it was sent. That at least would solicit the immediate feedback he was looking for, although limited by the expressionless text.

Evening light slid across the water of Lake Geneva in slow, deliberate bands. Halverson stood by the window when the message chimed, his reflection doubling in the glass.

Halverson didn't open the message immediately. His past association with Duval made it likely there was some dubious offer in the making.

"It's been a long time, Johnathan," the message began. "Longer than we should have allowed."

"Not long enough," Halverson thought to himself. He finally sat down and answered. "Armin, I was not expecting to hear from you again. What's this about?"

Duval answered. “History is accelerating. You and I have always known how to recognize an opportunity.”

“When interstellar travel begins,” Duval continued, “Fleet will need propellant at a scale no one on Earth or the Moon can support. Mars can. Refining, storage, logistics—I already have the infrastructure. What I need is certainty.”

“You want a monopoly,” Halverson answered flatly.

“I want a guarantee,” Duval corrected. “Primary supplier. Preferred partner. Call it what you like.”

Halverson shook his head even though no one could see him. “I work for the Warp Drive Consortium now. I don’t decide where Fleet gets its fuel.”

Duval saw his opportunity. “You advise the people who decide. You frame the risks. You shape the timelines. You always have.”

Halverson paused letting the last message sink in. He then took an educated guess at the pending proposition. “You’re suggesting I use my influence to channel Fleet ships through Mars instead of the Moon for fuel.”

“I’m suggesting,” Duval said framing his words carefully, “that once Fleet sees what Mars can support, the question answers itself.”

Duval made his final pitch. “You must feel it too. The clock. Another few years, maybe less. Directors like you don’t retire quietly anymore. They transition.”

“Consulting. Advisory boards. A seat with real leverage. All very aboveboard,” Duval added. “You’ve earned that much.”

Halverson stared blankly. For a moment, the weight of decades pressed down on him—choices made, lines blurred, favors traded in the name of progress.

Duval gave his closing remarks, then disconnected. “Think about the ships. Think about Mars. And think about what comes after Geneva. Take care, my friend.”

CHAPTER 16



The air inside the mine's surface dome carried the faint metallic tang of recycled oxygen and Martian dust. Pale light filtered through the translucent dome panels, casting long shadows across the temporary tables and the mobile holo projector at the center.

Jacob stood at the head of the group, tablet in hand, his voice steady but edged with fatigue.

"Alright, listen up. Before anyone sets foot below, I want to be clear. The structure is still unstable. Reinforcements are incomplete, and the bracing along the lower level where we're headed hasn't been load tested. If something shifts, you won't have much warning."

He tapped the display, and a holographic wireframe of the excavation site appeared above the table. The ancient Martian structure, honeycombed with partially collapsed passageways, flickered in the dust.

"We'll ride down the descent platform to the excavated cavern below the surface, then climb down below the ice to enter the structure here," pointing to the location previously entered by the drones.

Sera stood beside him, arms folded, watching the projection with quiet concentration. She was having second thoughts about insisting on being part of the entry team.

The investors clustered nearby, both wearing the same expression of excitement and impatience that made Jacob anxious.

“Now,” Jacob continued, zooming in on the third level down, “this section is our objective. We think it’s a data center. We’ll climb down through the turbo lift shaft using the laddertube installed by my crew. The corridor leading to the data center has been partially cleared, but the ceiling load is uneven. We’ll be sticking to the support grids my team installed last week. Step off those grids, and you’re standing on unstable ground. Don’t test your luck.”

Vexa, standing near the back, nodded as she checked her console. “Lewis will be heading down with you. I’ll be monitoring your suit telemetry and the limited structural stress readings we have from up here. If I tell you to pull out, you pull out.”

One of the investors, a tall man in a polished company jacket, gave a polite, nervous smile. “How likely is a collapse, Mr. Holt?”

Jacob met his gaze evenly. “Less likely if you follow instructions. More likely if you don’t.”

That earned nervous laughter from the group, which did nothing to ease the tension.

Duval stepped forward, his usual expressive mix of confidence and authority falling flat down here. “We all understand the risks, Mr. Holt. But our investors have come a long way to evaluate what’s down there. Let’s keep it safe and don’t linger.”

The group exchanged glances as Jacob bit back a retort, settling for a nod. “Understood. Safety first.”

He set down the tablet and gestured toward the prep area nearby where inside environmental suits were arranged on a rack.

“You’ll each be fitted and sealed by one of my techs. The suits are light-assist, designed for low-gravity maneuvering.

Air mix is calibrated for long-duration exposure. The temperatures in the lower levels drop fast. Keep your heaters on auto-regulate.”

Sera glanced towards the descent platform. “How’s the atmosphere down there now?”

“Thin,” Jacob said. “Breathable for about two minutes if you’re lucky, but not worth testing. Stick to suit air. We’ve sealed the upper tunnel to minimize leakage. The escaped air is making the site more unstable.”

The investors exchanged uneasy glances.

Jacob looked around at them, first at the director then the investors, all waiting for him to say it was safe when it wasn’t. He cleared his throat.

“Bottom line—the reinforcements aren’t complete, and we’re going in anyway. So stay alert, stay calm, and stay together. If anything shifts, we abort immediately. Understood?”

Nods all around.

“Good,” he said. “Suits up in ten. Vexa, send Lewis down for live feed before we enter.”

“On it,” Vexa said from her console, fingers moving quickly.

As the team dispersed toward the prep zone, Jacob lingered a moment beside the table, eyes fixed on the holo. The data center glowed faintly at the bottom of the map, a rectangular ghost buried under rock and ice.



The prep zone was a sectioned-off area of the dome lined with the environmental suits, compressed air tanks, and tool harnesses. The hum of power units filled the space as

technicians moved about, checking seals and verifying oxygen tanks.

Jacob slipped into his underlayer, the soft weave tightening around his limbs as it activated. A tech handed him the rest of his suit, matte-gray and surface-scarred from months of excavation work. He stepped into it methodically, the motions automatic after years in the mines.

Across from him, Sera was inspecting the seals on her helmet. She caught his glance and smirked.

“Still time to back out, Jacob. Let the rich guys make history on their own.”

Jacob snorted. “And let them get themselves killed? I’d never live it down.”

The first investor, Dr. Alaric Voss, was struggling with his arm seals. He was in his late fifties, silver-haired, his academic calm strained by the unfamiliar machinery. A former astrophysicist turned venture visionary, Voss commissioned the first commercial deep space vessel to mine the asteroid belt.

“I thought these were self-adjusting,” Voss muttered, tugging at the sleeve.

“They are,” Jacob said, stepping over. “If you stop fighting it, the suit will calibrate automatically.” He tapped a control on the chest plate, and the seals hissed into place with a satisfying click.

Voss looked up, slightly embarrassed. “Ah. Operator error, then.”

The second investor, Rafi El-Masri, leaned casually against a supply crate, helmet tucked under one arm. Younger than Voss, mid-thirties maybe, his confidence bordered on arrogance. His family’s Moon mining conglomerate had been

among the first to partner with the MMC for Mars infrastructure.

“Operator error is the least of our worries,” Rafi said, flashing a grin. “You sure these things can handle a cave-in? I read the specs. Lightweight means fragile under compression.”

Jacob inspected the seals on his own helmet. “They’ll hold as long as the cave doesn’t come down on you. You claustrophobic, Mr. El-Masri?”

“Not since I was twelve,” Rafi replied smoothly, slipping into his helmet. “And it’s Rafi. We’re all explorers today, right?”

Sera rolled her eyes but smiled despite herself. “Explorers, sure. Some of us just a little more experienced than others.”

The team’s laughter lightened the tension for a moment.

At the far end of the prep area, Vexa was at her console, verifying each suit telemetry link one by one.

“Comms check,” she called out after Voss finally clicked his helmet into place.

“Channel A—team intercom. Channel B—uplink to dome. How do you read?”

“5 by 5,” Jacob said.

“Copy,” Sera added.

“Voss here.”

“Rafi here, ready to make history.”

They all switched to Channel A and completed the intercom voice checks.

Jacob gave a thumbs-up toward the comm tent. “We’re good, Vexa. Keep us tight on sensors. If you see any stress anomalies, you call it immediately.”

“Got it. Be careful down there,” Vexa said, her tone softening for a beat.

They exited the prep area, revealing the red-lit shaft. The temperature dropped perceptibly as they stepped forward, boots clanking on the grated walkway.

As they reached the edge of the descent platform, Jacob took a steadying breath. Beyond the safety rail lay the mouth of the excavation.

Sera glanced over at him, her voice crisp in his helmet comm. “You ever get tired of being the first one into the dark?”

He gave a quiet laugh. “Every damn time.”

The platform began to lower, dust swirling around them as the lights dimmed and the cavern below slowly emerged.

Above, Vexa’s voice crackled through the comms.

“Telemetry locked. You’re clear for entry, team.”

Jacob’s grip tightened on the rail. “Alright,” he said. “Let’s make this quick and careful. Keep your head on a swivel and your egos in check.”

The platform touched down with a soft thud. The four figures stepped into the cavern. The air was thin and cold, whispering faintly through the surrounding walls. As they descended the access tunnel the ancient ruin stood silent and waiting, its angular features barely visible in the shadow.



The team’s boots crunched over eons of dust and shattered composite as they stepped into what was once the lobby of an administrative building. The faint beam of their helmet lights cut through suspended motes of red grit, catching the outlines of corroded furniture and fractured wall panels.

Jacob’s voice came through the comms, low and steady.

“Watch your footing. Ground sensors detected voids beneath the east corner—probably collapsed sublevels.”

“Copy that,” Sera said, her visor HUD populating with data overlays. “Hard to believe this place stayed sealed until we cracked it open.”

Behind her, Lewis floated silently through the doorway. Its thrusters emitted a soft whine as it adjusted altitude, scanning arcs of blue light across the chamber. The carbon-scored housing still bore the repair patches from the last entry.

“Lewis, start a local map,” Sera said. “Keep it tight to ten meters. No heroics this time.”

The drone beeped once in acknowledgment. The sound had a clipped, almost sulky tone that made Rafi chuckle.

“Does it actually have a personality?”

Jacob answered before Sera could. “That’s just your imagination.”

“Hey,” Sera said, mock defensive. “He’s earned his quirks. Lost his partner to collapsing debris last time. I’d be edgy too.”

Lewis emitted another series of diagnostic chirps, as if in agreement, and projected a grainy three dimensional scan of the room against the floating dust. The loose grid revealed structural remnants—broken supports, what looked like a shattered glass atrium above, and the outline of the turbo lift shaft straight ahead.

“We think this is a lobby,” Jacob said, studying the projection. “Reception area or security checkpoint. Those alcoves on the north wall—could be terminals.”

Sera moved closer to one of the alcoves. Embedded in the wall was a kiosk, half-buried under dust and fragments of

composite. She wiped a gloved hand across the interface plate, smearing a faint trace of frost.

“Definitely a terminal,” she murmured. “Looks like it ran local access—maybe admin or personnel systems.”

Voss leaned over her shoulder, fascinated. “The material—is that crystalline substrate? I’ve never seen anything like it.”

Sera’s scanner pinged softly. “Getting an energy signature...residual charge, extremely weak but still coherent.” She reached into the panel with a precision tool and pried open a housing compartment. Inside, nestled among layers of fractured circuitry, was a small data crystal, faintly reflective in the dim light.

“Well, look at that,” Rafi said. “Still glowing after billions of years. That’s some battery tech.”

Sera turned the crystal over carefully in her hand, the facets catching the reflection of her suit lights. “Not a battery—data storage. Could be records, could be junk. We won’t know until we interface it topside.”

Jacob’s tone sharpened. “Let’s not push our luck down here. Bag it and tag it. Lewis, mark the location.”

The drone chirped affirmatively and pulsed a soft white light over the kiosk, logging the find.

As Sera slid the crystal into a shielded sample container on her belt, a low creak echoed through the chamber—the sound of shifting stone and fatigued metal. Water trickled from the ceiling, a faint reminder of the slowly melting ice above.

The turbo lift shaft groaned as the team climbed their way deeper into the buried complex. Their suit lights cut thin beams through clouds of ancient dust as they exited the shaft into a narrow corridor, the walls lined with skeletal conduits and what was once luminescent panels. The air here was

colder, the pressure thinner. Frost laced the corners of the passage where the atmosphere seeped in and froze.

“According to the drone survey,” Jacob said, glancing at his wrist display, “the data center should be another twenty meters down this hall, through the next bend.”

Rafi’s voice crackled over the comm. “Can’t believe this place still holds together after all this time.”

“Yeah, well,” Jacob muttered, “let’s not test how much longer it plans to.”

Sera kept close behind him, Lewis floating silently at her shoulder, its sensors pulsing soft blue as it mapped ahead. The drone’s whirring hum was almost comforting, like a companion’s heartbeat in the stillness.

As they rounded the corner, the remnants of a prior collapse partially blocked their path, obscuring the view ahead. A warped ceiling beam hung half suspended in a mound of rubble. Clark lay partially buried beneath fragments of composite and ancient insulation.

Lewis let out a slow series of beeps, reminiscent of a low sigh.

Suddenly, Vexa’s voice broke over the comms from the surface.

“Jacob, I’m getting spikes on the ground sensors—seismic tremors registering—”

The rest dissolved in static.

“What was that?” Sera began, but she didn’t get to finish.

The floor shuddered violently. A deep, guttural roar echoed through the corridors, followed by the bone-deep vibration of collapsing stone. A low-frequency wave hit them like a punch—a Marsquake.

“Down!” Jacob shouted.

Their headlamps flickered as the ceiling fractured, shards of composite raining down. Another overhead beam gave way with a metallic scream, slamming into the floor between them and Voss.

“Voss!” Sera shouted, reaching back, but a wall of dust and debris erupted, swallowing him whole. His vitals flatlined instantly on her HUD.

And Rafi was nowhere to be seen, caught between Sera and Jacob and a wall of debris.

“Oh—God—” Rafi’s voice came through, ragged, “My suit—breach in my left arm—losing pressure!”

“Seal it!” Jacob barked. “Emergency patch kit—now!”

“I’m—trying—” Static swallowed half his words but the feed held.

“Lewis!” Sera called. “Status!”

The drone emitted a flurry of tones, its sensors reorienting after the shockwave. It hovered shakily, then stabilized, projecting a real-time map of the corridor. Red sections flashed where the structure had given way. There was no way back up.

“Ceiling’s collapsed behind us,” Jacob said, scanning the map. “We’re trapped between two major cave-ins.”

Sera’s breath came hard and fast, fogging the inside of her visor. “Any path forward?”

Lewis rotated, scanning ahead. A narrow channel barely a meter wide showed open toward the deeper levels.

“There’s a way,” Jacob said grimly. “Maybe. But it’s tight.”

“Forget the way out,” Rafi wheezed over the comm. “Just—don’t leave me, okay?”

“We’re not going anywhere,” Sera said, her voice steady but her pulse racing. “Stay put, Rafi. Seal that leak. We’ll get you out.”

Static hissed briefly, then Rafi's voice returned, softer.
"Copy that, Doc."

Lewis drifted closer to Sera, projecting faint light across the wreckage. The drone had sustained minor damage. One sensor arm was bent, its navigation subroutines compensating. It emitted a low, resigned beep, as if it too could sense the gravity of their situation.

Sera slowed her breathing. "We're alive. For now."

Jacob's expression was tight behind his visor. "Let's keep it that way. Once the dust settles, we'll find another route up."

The comm to the surface was dead. Vexa's voice was lost to static.

Above them, Mars trembled again. The sound was deep and distant, like the planet was shifting in its sleep.

Sera looked down at the glowing outline of the data crystal strapped to her belt—an impossible artifact from an ancient world—and she began to wonder if this place was meant to stay buried.



The dome's warning lights flashed crimson against the dust-hazed air. Vexa stumbled out of the comm tent, wind tearing at her jacket. A fissure nearly twenty meters long split the dome. The jagged wound bled atmosphere into the thin Martian sky while water spilled from the fractured panels, flashing into mist and ice.

"Suit up, now!" she shouted over the rising alarm.

Duval stood frozen in the tent, face pale as ash. "You'd better make damn sure my investors get out of there alive."

"Get him in a suit, now—and kill his comms!" Vexa snapped.

Her crew moved fast, helmets locking with mechanical clicks, oxygen feeds hissing to life. The air inside the dome was already thinning, pressure dropping by the second.

“Get auxiliary power online,” she ordered, voice sharp but steady. “I need the comms array up yesterday.”

A nearby tech pointed toward the main shaft. “The platform’s gone—total collapse!”

Vexa turned, staring at the gaping pit where the lift had been. Only a haze of drifting dust marked the entrance below.

“Forget the platform,” she said. “If they’re still alive, comm’s the only thing that’ll save them.”

She knelt beside the half-dead console, fingers flying over the manual overrides as static hissed through the open channel. Somewhere beneath the shattered rock and ancient architecture, she imagined Sera’s voice calling back.



The air was still thick with dust, and Rafi was buried somewhere in the rubble. Lewis hovered above, the sweep of its floodlight cutting through the haze, the faint whir of its stabilizers echoing in the ruin.

“Rafi!” Sera called, her voice crackling over the suit intercom.

A faint reply came through the static. “Here! I’m—damn it—pinned.”

Lewis began to chirp excitedly, focusing the light at a heap of collapsed ceiling material. Jacob and Sera began working steadily, prying aside slabs of fractured composite and shattered alloy.

They found him wedged beneath a collapsed beam, one leg twisted at an unnatural angle. Jacob crouched, checked the seals on Rafi's suit. His oxygen gauge blinked yellow.

"Ankle's broken," Jacob said, his voice tight. "Pressure's holding. You'll live."

"Lucky me," Rafi muttered, wincing as Jacob splinted the leg with a length of conduit. Jacob then connected his own O₂ tank's auxiliary port to Rafi's tank, transferring the gas until Rafi's gauge turned green.

When they finally pulled free of the rubble, the corridor ahead opened into a broad landing, what was once the lower concourse. The dust settled enough to reveal what lay beyond: a mangled staircase and shattered floor lights leading toward what should have been the data center.

Sera moved closer, sweeping her helmet light along the way down. Her breath caught. "It's gone," she whispered. "Completely collapsed."

Jacob followed her gaze. The access way was choked with debris and what looked like frozen vapor seeping from ruptured conduits. The data center was buried beyond reach.

Rafi leaned back against the wall, panting. "Then this is it. We're done."

"Not yet," Jacob said. His voice carried a low, deliberate calm that indicated he was already planning their next move.

He turned toward a turbo lift shaft a few meters away, half-collapsed but still open near the top. "We might have a shot there."

Sera followed his line of sight then glanced at Rafi. "No way we're climbing. You think Lewis can get up there?"

"Maybe. Depends how bad the blockage is. If the ice layer near the surface is thin enough, his transponder signal might be detectable from the surface."

Sera knelt beside the drone, brushing the dust from its housing as if speaking to it might help. “You hear that, Lewis? You’re our lifeline now.”

The drone beeped softly with a faint, nervous chirp that sounded almost alive.

Jacob checked their oxygen levels on the HUD. Rafi’s was already down to twenty-eight percent. “We’ve got maybe an hour, tops. Rafi, try to slow your breathing. Sera, help me clear the shaft.”

The two of them moved toward the opening, their helmet lamps throwing long shadows against the fractured walls. Above, the faint tremor of settling stone whispered through the ruins.

And somewhere beyond the layers of ice and rock, Vexa was waiting.



The surface dome was chaos. Red hazard lights pulsed against the cracked panels above. Dust swirled in the emergency floodlights. Everything an unwelcome distraction from the rescue effort.

Vexa shoved past two techs fumbling with a damaged power conduit on her way towards the backup generators. “Forget the lights,” she snapped. “I want surface comms. Now.”

She switched her suit radio to the emergency broadcast channel and her helmet crackled with static. She slammed a hand against the generator’s control console, then rerouted the power bus through a circuit protection bypass. The displays shuttered, then came alive.

She switched back to the suit intercom. “Try it now!”

“Signal array’s online,” one of the techs answered back.

“Finally,” Vexa said, switching back to surface comms.

Static crackled, then parted. Her voice carried up through the fractured dome to the tower atop the *Ares* landing platform like a thread of hope.

“*Ares* rescue, this is MMC mining site twelve declaring an emergency. We have trapped miners sixty meters below surface. Location unknown. Rescue beacon squawking on one two one dot five.”

Moments later the sky answered.

A tilt-rotor rescue craft knifed through the dust, its dual rotors swiveling as it descended in a tight, purposeful spiral. Floodlights cut bright cones through the dust, sweeping over the jagged perimeter where the dome had ruptured. The craft hovered low, engines thundering against the broken support struts.

“Rescue Team One, commencing search pattern,” a calm voice reported over the restored channel.

The aircraft drifted into a grid, its lights slicing across the scarred ground. Every sweep revealed more of the dome’s fractured ribs, the debris, the gaping wound that led downward into darkness. On the fourth pass, the copilot leaned toward the cockpit’s grid overlay.

“Contact! Recon drone lima-three-niner—steady ping.”

Lewis’s transponder, weak, but readable.

The pilot brought the craft around sharply, banking into a tight arc over the dunes until the signal peaked. Coordinates transmitted across the surface comm net.

Teams were already moving.

A pressurized mining rover from the refinery tore across the terrain, suspension groaning as it bounded over ridges and dust-slick rocks leaving a boiling wake of red grit behind.

Inside, the rescue crew braced themselves against the violent jolts, checking seals, gear, and rigging equipment between impacts.

The rover skidded to a halt at the marked coordinates, hydraulics hissing as the doors punched open. Suited figures dropped to the ground, boots sinking slightly into the loose dust. In practiced motion they unloaded the portable drilling rig, deploying stabilizer legs, anchoring the frame, and driving the cutter head into the soil with a rising mechanical howl.

Vexa monitored from the shattered dome, her voice steady but urgent.

“Depth?”

“Ten meters...fifteen...twenty...”

The drill head bored downward, plumes of fine dust fountaining upward in weightless streams that clung to the rescuers’ suits like rusted snow. The rig vibrated harder as it reached colder, denser strata.

“Thirty meters...”

Static flared in Vexa’s earpiece—then a voice broke through, faint and ragged.

“...Vexa?...copy...?”

Jacob.

Her breath caught. “I hear you! Hold on—we’re almost through.”

The rescue crew pushed the drill deeper. The rig shuddered, tone rising as it breached an air pocket.

“Forty meters. We’ve got a cavity!”

With the channel re-established, the team wasted no time. They secured oxygen tanks and water packs to a tethered capsule and lowered it carefully down the new bore. Minutes stretched like hours until Jacob confirmed receipt.

“Supplies in hand...Sera’s good...Rafi’s stable...lost Voss.”
Now came the harder part.

The rig powered down and the crew swapped out the bit for a widening cutter, an industrial maw built to carve a human-sized shaft through solid ground. The process would be long, dangerous, and exhausting. But every rotation of the cutter, every shower of sediment, inched them closer.

Above, the tilt-rotor circled, its lights sweeping the scene.

Below, in the dim caverns of the Martian ruins, three trapped explorers listened to the distant, rhythmic thunder of the drill.

Help was on the way.

PART 2

“What we observe is not nature itself, but nature exposed to our method of questioning.”

— *Werner Heisenberg*

CHAPTER 17



The vineyard stretched down the slope in neat, green rows, the air heavy with the smell of soil and sun-warmed grapes. Mike knelt beside one of the trellises, clipping a stray vine, when he heard Richard's boots crunch the gravel behind him.

"I've been meaning to congratulate you on the successful test."

"Thanks," Mike said, glancing over his shoulder. "Didn't think you were a fan."

Richard leaned on the fencepost, squinting at the distant hills. "Yeah, well...what you and your team pulled off, it's remarkable...even if it was just a simulation."

Mike gave a faint smile, eyes on the vine. "I'm just...concerned we don't really understand *why* it worked."

Richard laughed softly. "Leave that to the scientists. They'll sort it out. It's always easier to solve the problem when you already have the answer."

Mike smiled faintly at that. Exactly, he thought. So why haven't they?

He set the pruning shears down and straightened, gazing toward the horizon.

"You know, before I met Helena, I never thought twice about why we're going. That drive to explore—it's human nature."

"The risk is manageable. You test, fail, learn, retest until all the questions are addressed. Then you know you're ready. But this feels different."

Richard smirked. “Mike, those vines won’t prune themselves.”

Mike chuckled softly, but the sound died in his throat. For all their triumphs, humanity was still pretending. They were on Mars, but they hadn’t truly left home. Not in spirit.

The warp signatures that whispered against the silence of the stars light-years away haunted him. The AI reshaping physics to make the impossible work. And now rumors of a destroyed city beneath the ice on Mars.

Pieces of a puzzle from a different box.

When he looked up, Richard was studying him with that quiet, satisfied grin of his, as if he knew what Mike was thinking.

Mike turned back to the vines, weighing where to cut next, when suddenly his wrist comm buzzed. He almost ignored it. He’d only put it on out of habit.

“Great news, Mike,” came Director Halverson’s voice, bright and rehearsed. “The WDC has decided to suspend warp integration on *Astraeus* in favor of channeling all resources into the new Orion-class. The cost overruns and delays were unsustainable. *Eos* will be the first ship to attempt warp flight.”

Mike frowned. “Wait—how is that good news?”

“I’m getting to that,” Halverson said. “We’re promoting you to Captain and giving you command of *Astraeus*.”

Mike blinked. “Fleet Command will never approve that. I’m an engineer, not a starship captain.”

“Fleet’s eager to get *Eos* operational and more than happy to hand us *Astraeus* along with the budget relief. They’re giving us full operational control. Your detail with WDC continues—if you choose to accept.”

Mike turned toward the vineyard, the afternoon sun slanting across the valley. “What’s the mission?”

“Mars,” Halverson said. “The usual. Tourists, miners, cargo for MMC. They’re funding the mission, love the optics of a Fleet ship running on their fuel. While you’re there, work the integration logistics with MMC for future staging. And, off the record, finish the warp integration quietly, without all the bureaucratic nonsense slowing us down.”

Mike let out a low whistle. “A Fleet-owned ship, operated by WDC, funded by MMC. What could possibly go wrong?”

“So, you’re in?”

“Two conditions,” Mike said. “I pick my own command crew. And families come along.”

“Done and done.”

“Wait—one more thing.”

“You’re killing me.”

“I’ve got an idea for modifying the *Astraeus* Forward Sensor Array to detect warp signatures. It’ll take some engineering, and maybe a little hardware.”

Halverson chuckled. “If you can justify it, I’ll find the funding. Just keep the costs...reasonable.”

The line went dead.

Richard was standing by the next row, arms crossed.

“What was that about?”

Mike smiled faintly. “I value my marriage too much to answer that without talking to Helena first.”

“Fair enough.” Richard turned back toward the vines.

“Then let’s finish this slope before sundown, Captain.”

Mike laughed softly, the title still strange on his tongue. He bent to the vines again, though his mind was already a million miles away and counting.



The house was quiet, the last streaks of sunset fading through the kitchen window. Napa Valley evenings had a stillness that never existed in orbit. No hum of reactors, no vibration through the deck plating, just the steady rhythm of crickets and the vineyard leaves whispering in the dry California breeze.

Helena was at the counter, drying a glass when Mike came in. She glanced up, saw the look on his face, and set the towel aside.

“You got a call,” she said softly.

He nodded, and pulled a chair from the table. “Yeah. From Halverson.”

“That didn’t take long.”

Mike managed a smile. “They’re giving me *Astraeus*. Full command. Promotion to Captain. Mars run, logistics, maybe a little...extra work on the side. It’s a skeleton crew, families along for the ride.”

She studied him for a moment. “You said you were done with the WDC.”

“I know.” He looked down at the chair but didn’t sit. “Look, I won’t do it if you don’t want me to. Not this time. We could stay here, teach, fix things that don’t involve vacuum or radiation.”

Helena turned toward him, arms folded loosely. “You’d last six months before you started staring at the sky again.”

“Not if you told me not to go.”

She smiled faintly. “That’s the thing, Mike. If I told you no, you’d still end up there. Maybe not tomorrow, maybe not with *Astraeus*, but sooner or later, you’d find your way back up. At least this way, we go together.”

His shoulders eased, the tension leaving him all at once.
“You sure?”

She nodded. “We’ve spent too long living on borrowed time between missions. Maybe it’s time to live in it.”

Mike finally sat, leaning forward, elbows on the table.
“Then it’s settled. I’ll start putting the crew together. We’ll make it work.”

Helena came around the table and stood behind him, resting her hands on his shoulders. “There’s something else.”

He turned to look up at her, puzzled.

She hesitated just long enough for him to notice. “We’re pregnant.”

For a moment, neither of them spoke. The world seemed to narrow to the sound of her voice, the faint hum of the refrigerator, the golden light spilling across the floor.

Mike stood slowly, taking her hand. “How long have you known?”

“Couple of days. I was waiting for the right moment.”

He laughed under his breath, a quiet, disbelieving sound.
“So much for staying grounded.”

Helena smiled. “Guess we’re taking our family to Mars.”

CHAPTER 18



The late afternoon light spilled through the wide glass windows of Mike's makeshift home office, slanting across the room in long, amber lines. Outside, the vines stretched toward the horizon in long orderly rows.

He tapped the console on his desk, scrolling through the contacts until he found Dr. Sandra Vaziri. With a brief pause, he opened the channel and started the call.

Sandra's face appeared on the display. Her office at MIT looked exactly as he expected: layered with deep space false-color images and stacks of research reports. She blinked in surprise when she saw him.

"Commander Renner," she said, smiling. "This is a surprise. Or should I say Captain now? Congratulations on the warp test result. The news made the rounds here."

Mike returned her smile, though his was tempered by the weight of what he was about to ask. "Thanks, Sandra. It's been...a long road getting here. But I'm not calling just to catch up."

Her expression shifted, curious. "What's on your mind?"

He leaned back in his chair, glancing briefly toward the vineyards before speaking. "The WDC's assigning me command of the *Astraeus*. We're taking her to Mars on a joint mission with the MMC. It's part logistics, part diplomacy, part...unfinished business."

Sandra tilted her head. "Unfinished business?"

“I’m modifying the forward sensor array,” he said, voice low with the faint excitement of an engineer about to break another rule. “Reconfiguring it into a warp signature detector. If Hawk’s analysis was right, those DMD anomalies you found weren’t noise. We could keep looking and extend the search properly this time.”

She stared at him, her analytical mind already racing. “Interesting. You think that could work?”

He grinned. “I told you we weren’t done.”

“Come aboard as the *Astraeus*’s science officer. Bring your family—the ring can accommodate them. You’re going anyway. This will be faster than the shuttle, with gravity, and safer.”

Sandra leaned back, folding her arms. For a long moment, the only sound was the faint hum of her office equipment. “You make it sound like an adventure,” she said at last.

“It will be,” he replied. “But more than that. It’s unfinished science.”

A slow smile tugged at her lips, though her eyes still held caution. “You know, I told Dr. Elise I was done chasing ghosts for a while.”

“Then chase something real,” Mike said quietly. “You and I both know that signal Hawk found is no fluke.”

She exhaled, half laugh, half surrender. “Alright, Captain. You win. But only because you said ‘family can come.’ My sister’s been dying to see Mars.”

“Then it’s settled,” Mike said, the weight in his chest lifting. “Welcome aboard, Dr. Vaziri.”

“Just Sandra,” she corrected.

He smiled. “Right. Sandra. I’ll see you on board.”



Mike leaned back in his chair. “Rhea Imani,” he murmured, scrolling through the list until her name appeared. He tapped connect.

Her face appeared a moment later, framed by the Seattle sky, washed in muted silver, glowing in the late afternoon sun. She was relaxed, hair down, a mug of something steaming in her hand.

“Mike Renner,” she said with a grin. “Shouldn’t you be lecturing students on the intricacies of warp stability by now?”

He smiled. “Thought I’d make one more questionable life decision before I go down that path.”

“Oh? And what kind of trouble are you dragging me into this time?”

“I’ve accepted command of the *Astraeus*.”

Her eyebrows lifted. “The *Astraeus*? As in, the ship they were never going to finish?”

“That’s the one,” he said. “Turns out they’re finishing it after all. WDC wants me to lead the mission. Routine Mars run—tourists, supplies, MMC contracts. But...it’s also a chance to keep working on the warp integration quietly. I’m building a crew.”

She leaned back, suspicious now. “Let me guess. You need a first officer.”

“I can’t think of anyone better.”

She looked out the window for a moment, thinking.

“You’re serious about this?”

“Yeah,” he said quietly. “I need someone I trust up there. Someone who’ll call me out when I’m wrong.”

She sighed, pretending to think it over. Everyone knew she was more comfortable floating than on firm ground. “I can already tell I’m going to regret this.”

“So that’s a yes?”

“Yeah, Captain,” she said, raising her mug in a mock salute. “I’ll see you on *Astraeus*. I was already getting bored down here anyway.”

The connection winked out. She pivoted back to the window. The Space Needle was framed by the afternoon haze, standing as a monument to a prior age. Far below, the crowd surged. There was another protest against warp flight, their signs bobbing like whitecaps. She found it strange. Humanity had never flinched at the sound barrier, the Moon landing, the first steps on Mars. But now? Now they hesitated. No matter. The future wasn’t waiting for anyone. And her responsibilities weren’t either.



Mike scrolled through the directory until he found Lin Zhao’s name. After a few seconds, Lin’s face appeared on the screen, framed by the dim blue light of *Kepler’s* engineering deck. Behind him, diagnostic panels glowed softly, the constant hum of the orbital station faint in the background.

“Captain Renner,” Lin said with a crooked smile, still wearing his utility jacket. “Didn’t expect to hear from you so soon. How’s Earth’s gravity treating you?”

“Still adjusting,” Mike said. “You holding things together up there?”

“As always,” Lin replied. “Though it’s quieter without the *Astraeus* integration crew setting off alarms every other hour. What’s up?”

“I’ve got a proposition,” Mike said. “I’m putting together a skeleton crew. We’re taking *Astraeus* to Mars. We’ll finish the warp field generator integration when we get there. And I need a chief engineer.”

Lin laughed, short and surprised. “Chief engineer? Mike, you know I’m an instrument guy. I calibrate quantum detectors and debug data systems. Fusion drives aren’t my language.”

“You know enough,” Mike said. “You have good instincts, you know how this system thinks.”

“That’s because it thinks like a paranoid cat,” Lin muttered, rubbing his temples. “And you want me to crawl inside its engine room?”

Mike smiled faintly. “That’s the idea. And I’m recruiting Natalia Korovin to be your right hand. We’ll need her expertise to finish the job once we’re docked at Mars.”

Lin’s eyebrows rose. “Natalia? She’ll say yes just to keep me from blowing something up.”

“Then it’s settled.”

Lin leaned back in his chair, shaking his head in disbelief. “You realize this means another year away from home. And Mars isn’t exactly a weekend commute.”

“I know,” Mike said quietly. “But this is ours now, Lin. No oversight, no bureaucrats. Just us, finishing what we started.”

Lin considered that for a long moment. “You’ve got a dangerous way of making that sound noble,” he said finally.

“It’s a gift.”

Lin sighed, half in defeat, half in amusement. “All right, Captain. I’ll start reviewing the *Astraeus* fusion drive specs.”



Mike sat at his desk longer than he meant to before initiating the final call.

Natalia's image resolved a moment later.

She was framed by the clean lines of a temporary residence—too neat, too empty. Her hair was pulled back, her expression composed in the way it always was.

“Captain Renner,” she said. “I imagine this isn’t a social call.” Straight to the point, as always.

“No,” he admitted.

She waited, arms crossed, giving him space to hang himself with words if he chose to. He'd always admired that about her. She never filled silence just to make it easier on someone else.

“I’m putting together a crew for *Astraeus*,” he said.

A sadness crossed her eyes, gone almost before he could register it, but he caught it nonetheless. The old wound. The fire. The retrofit canceled, then buried under layers of WDC bureaucracy.

“So,” she said evenly, “the ship placed in a quagmire is being set free.”

“Actually, it turns out there was always a backup plan,” Mike replied. “We were just kept in the dark.”

She let out a small, humorless breath. “That figures.”

For a moment, neither of them spoke. Outside, the sun was setting and a black-tailed deer stood among the vines.

“After the fire, safety took over everything,” she said at last, her tone controlled. “But you know that.”

“I do.”

“And then they canceled the upgrade entirely.”

“On paper,” he said.

Natalia tilted her head slightly. “Ah, so you’re calling to ask my help in finishing it.”

“Yes.”

She studied him through the screen, eyes sharp, searching for the part he wasn't saying yet.

“What's the mission?” she asked.

“Mars,” he said. “Once we're there, we finish the work. No committees. No endless reviews. No WDC stepping in every time someone gets nervous.”

That got a reaction. A tightening at the corner of her mouth. Not a smile, but close.

“You're serious,” she said.

“I wouldn't be calling if I wasn't.”

She looked away for a second, gaze drifting off-screen. When she spoke again, her voice was measured. “Who's your chief engineer?”

Mike didn't pretend not to understand. “Lin Zhao,” he said.

Her expression changed, just slightly. If someone didn't know her well, they would have missed it.

“I see,” she said.

“He was the right fit for this phase,” Mike said carefully. “Systems integration, the HQC. I'm upgrading the FSA. It wasn't a judgment on your work.”

“Makes sense,” Natalia replied. The words were smooth, professional, but the edge was there if you listened closely.

Mike leaned back in his chair, the wood creaking softly. “Nat, I need you. Not as a title, not as a concession. I need you because no one understands the power changes the way you do. You designed half the fixes we never got to implement.”

She met his gaze again, and this time she didn't hide the fatigue behind her eyes.

“You’re asking me to walk back into a program that never listened to me then quietly shoved me out,” she said. “To follow a ship whose retrofit was declared a dead end. And to do it under someone else’s direction.”

“I’m asking you to finish what you started,” Mike said.

The silence stretched. She didn’t rush it. She never did.

Finally, she spoke. “Turns out I’m between jobs at the moment,” she said, almost to herself. “The WDC made sure of that.”

Mike didn’t respond. He let the truth sit between them.

She straightened, shoulders squaring, the familiar professional armor sliding back into place. “Send me the latest ship status,” she said. “I want to see exactly what state *Astraeus* is in.”

A small weight lifted from Mike’s chest. “So you’re in?”

“Yes,” Natalia said. “I’ll do it.” She paused, then added, “Not because I like how any of this happened.”

“I wouldn’t expect you to.”

“But because I find unfinished work unsettling,” she said.

She ended the call without ceremony.

Mike stood up, watching the screen go dark. Outside, the sun dipped lower over the Napa Valley hills, the light fading into gold. For the first time that day, he allowed himself a thin, tired smile. *Astraeus* was no longer a ship in limbo; she was a chance at redemption.

CHAPTER 19



The International Center for Warp Research rose like a glass monolith above the outskirts of Geneva, the faceted tower catching the pale Alpine morning light and throwing it back in brilliant planes. Beneath the crisp walkways, the manicured courtyards, and the offices that housed teams from forty nations lay the true heart of the WDC's ambition.

The Warp Dynamics Integration and Test Facility stretched for nearly a kilometer underground, rows of reinforced steel girders and suspended gantries. The facility felt like an active storm, even when idle. Massive superconducting cables lined the walls, feeding power into the spherical test cavity at the chamber's center. This was the place where spacetime was first bent by humanity in a controlled and measurable way.

Here was where they developed the first HQC prototype, focusing gigawatts of shaped field energy into a lattice of sensors so sensitive they could detect a passing neutrino. And it was here, a moment ago, that the new controller logic derived from Hawk's indecipherable solution produced the cleanest micro-warp displacement ever recorded.



Dr. Amina Covington rubbed her eyes and leaned closer to the transparent screen. "Pull it up again," she said, voice hoarse from too much coffee and too little sleep.

Dr. Ilya Moravec obliged, fingertips tapping quietly on his tablet. The visualization rendered: a wireframe of spacetime curvature, pulsing in time with the controller algorithm.

“Ilya,” Amina muttered, “the logic shouldn’t even converge. Hawk derived a control solution we don’t—couldn’t have. The curvature is inherently stable. That’s not possible.”

“It is now,” Ilya said, though unease creased his brow. “Look at this damping function.” He zoomed into a section of the curve. “It’s as if it anticipates the instability before it forms. Predictive corrections multiple cycles ahead.”

“That’s not prediction.” Amina folded her arms. “That’s... insight. It’s reasoning about the geometry. But it shouldn’t be able to. The new solution doesn’t even use the coefficients that define the boundary conditions.”

Frustration was building. They always knew a few tweaks to their algorithm would be needed to match the solutions. Now, after decades of meticulous research, it felt as though they were starting over.

A third scientist, Dr. Sabine Köhler, stood at the observation window looking into the cavernous test chamber below. “Maybe Hawk inferred it,” she said without turning. “Pattern completion, extrapolation. Deep learning nets do that.”

Amina shook her head. “Yes, but we’ve always been able to reconstruct the logic. It’s like it’s using...a different script.”

“Or an optimization,” Sabine suggested.

Ilya sighed and leaned back. “An optimization we can’t unravel. Wonderful.”

Amina glanced at the wall display where the test summary floated: Micro-warp Translation: 4.2 millimeters. No decoherence. No harmonic instability.

A result that would make a career. Numbers that made no sense.

“If we publish this,” she said quietly, “every physicist on Earth will demand the derivation. And we don’t have one.”

“We have the results,” Sabine countered.

“Yes,” Amina said. “But results without supporting analysis are not science.”

Sabine switched to a different tack. “Look, we delivered a solution years ago. It works. It’s fully vetted. Repeatable. Why don’t they just go back to using what we delivered. Granted, it’s not as elegant as whatever this is.”

Ilya sighed. He knew Sabine knew why, but she probably just needed to hear it out loud. “They’ve spent nearly five years trying to get that solution to function during integration on *Astraeus* and failed. I think it’s safe to say there’s something missing in that algorithm, and Hawk, somehow uncovered it.”

“That’s not our problem. Sounds like engineering needs to figure it out.”

Ilya walked over to the observation window next to Sabine. “Sabine, all of this doesn’t exist as a playground for scientists. There’s a grand purpose to it, and we’re part of that. Patience and funding are wearing thin.”

Amina said what they were all thinking. “If we can’t come up with some explanation to satisfy the WDC soon, they’ll find someone who will.”

They fell silent, each absorbed in the data cascading across the screens. Outside, the Alpine dusk slipped toward night. The facility’s environmental controls cycled with a distant sigh, the only sound in the vast chamber beyond the glass.



What the scientists didn't know, couldn't know, was that at the edge of the spacetime curvature, an instant before the familiar ionized dark matter signature formed, something else appeared. A blip of inverted curvature. Tiny. Fractional. Wrong. It flickered and was gone. The analysis tool didn't flag it because it was indistinguishable from noise.



The briefing room at ICWR was carved out of glass and steel, a long oval chamber suspended over the cavernous test hall below.

Dr. Covington stood at the table, eyes rimmed red from too many sleepless nights.

"This is the cleanest warp field we've ever produced," she said. "Not marginally. Orders of magnitude. Stability, symmetry, energy efficiency—every metric exceeds anything we've logged in twenty years of testing."

Dr. Köhler leaned forward, swiping to a new plot. "And it was generated using the null coefficient matrix. No geometry terms. No boundary conditions. The controller converges anyway, just as with the last simulation run on *Astraeus*."

A low murmur rippled through the room.

"That's the problem," Amina continued. "We can't explain why it works. The field shouldn't close. The math doesn't support it. Yet there it is."

Director Halverson sat back in his chair, arms crossed, jaw set. "You're telling me the best result you've ever had is something you can't explain."

“Yes,” she said without hesitation. “That’s exactly what we’re telling you.”

Halverson let out a slow breath. A tap on his wrist changed the projection to the project calendar. “I have a Flight Readiness Board briefing in two weeks. Two. And I’m already walking in with a story they won’t like—the move from *Astraeus* to *Eos* midstream.” He looked back at them. “I need you to figure this out before then.”

Dr. Moravec spoke up from the far end of the table. “Director, our recommendation is to delay any warp test on *Eos* until the Hawk-derived controller logic is understood. What we’re seeing is unprecedented. We don’t know the failure modes.”

Halverson’s eyes narrowed, focused on the calendar. “*Eos* is launching from Pacific Gateway in two days. She’ll begin final systems integration on *Kepler* immediately. Best case, she’s flight-ready in a month. You’re asking me to put all of that on hold.”

“Yes,” said Ilya. “We are.”

Before Halverson could respond, a voice cut in smoothly from the back of the room.

“There’s really no need for that.”

Heads turned.

The man who spoke was not part of the ICWR team. He stood with easy confidence, jacket open, hands relaxed at his sides, as if he’d always belonged there. He smiled, just barely.

“I’ve reviewed the controller algorithm,” he continued. “In detail. There’s nothing anomalous about it once you see the eloquence of the solution.”

The room went still.

Sabine frowned. “I’m sorry—who are you?”

“Dr. Marcus Vale,” he said pleasantly. “Vale Consulting. Hired by the WDC to review the test results from *Astraeus*.”

“That data isn’t publicly available,” said Amina, suspicion creeping into her voice. “The coefficients—”

“I know,” Vale replied, unbothered as he walked toward the table. “And yet, the solution is sound. Elegant, actually. The AI didn’t invent new physics. It recognized a constraint humans have been insisting on that simply doesn’t apply.”

He tapped the display, pulling up a clean, simplified rendering of the field. It looked beautiful. Effortless.

“I’ll be releasing my white paper shortly,” Vale went on. “It explains everything. Once it’s out, this will all seem rather... overly cautious.”

Halverson studied him. “You’re saying there’s no risk.”

“I’m saying the risk is the same as it’s always been,” Vale answered smoothly. “And the opportunity is well...historic.”

The WDC board members exchanged glances. Vale’s confidence was contagious. He spoke with certainty, with charm, with the kind of calm that made doubt feel provincial.

Across the table, the ICWR scientists remained skeptical.

They didn’t know this man. They didn’t know how he accessed the data. And they didn’t like the way the room was already leaning toward him.

But Halverson straightened in his chair.

“Very well,” he said. “Release your paper. I’ll include it in the FRB packet.”

Amina opened her mouth to object, then stopped. The room had already shifted.

Vale smiled again, small and assured.

CHAPTER 20



The scattered marine layer still clinging to the launch platform at Pacific Gateway cast the morning sky in soft pastel tones. On the horizon, *Eos* stood poised, sleek and silver, her hull catching the rising sun in twisting beams of light.

When the countdown reached zero, the Earth trembled.

The *Eos* rose on a column of yellow-white fire, the roar of the triple strap-on boosters flattening the waves far below. For a moment, she seemed to hang between sea and sky, a perfect stillness in motion. Then she climbed, slowly pitching over as the acceleration ramped toward orbital velocity. When the solid propellant burned out, the booster scramjets took over, powering the ship through the stratosphere.

From orbit, *Kepler's* long range optics tracked the launch. The station's residents gathered along the observation deck to witness the historic launch. Their heads turned from the monitors to the viewport as the bright sphere of light emerged, leaving a fading contrail in its wake.

Minutes later, the *Eos's* burn softened, and the boosters separated to begin their reentry. The starship transitioned to OMS providing the final push to match the station's orbit.

In the shadow of *Kepler*, the *Astraeus* came alive. Her RCS thrusters lit in steady rhythm, and she began to drift from her dock, a stark contrast to the pristine newcomer. The *Astraeus* still wore the marks of retrofit: scorched panels, bulky warp

field generator coils welded to her hull through reinforced seams, the quiet hum of a ship with history.

She eased away, pivoting on her axis, ascending into a higher parking orbit.

In near unison, the *Astraeus* habitat ring, with its Mars bound passengers already embarked from *Kepler*, began slowly rising toward the waiting host.

As the ship and ring cleared the docking perimeter, the *Eos* maneuvered forward taking the place of her predecessor. Docking clamps engaged with a hollow metallic thud that resonated through the *Kepler's* superstructure.

The *Astraeus* now hung higher above, scarred, but proven.

Two ships. One ascending to the next mission, the other's just beginning.

And far below, the insouciant Earth rolled on beneath a thin blue haze, unconcerned that the age of the stars was beginning.



The joining of *Astraeus* with the habitat ring played out like a ballet between steel giants.

The ring glittering with navigation beacons drifted in on inertia before its RCS jets spat brief cones of fire. Each pulse halted a wobble, corrected a drift, nudged the ring into perfect alignment with the *Astraeus'* midsection. The ship responded in kind; RCS thrusters set along the spine fired in crisp, precise bursts to maintain station keeping. For a few seconds the two structures hung in space like wary partners closing the final distance between them, each adjusting by fractions.

The ring spokes aligned to the circular receptors on the *Astraeus*' hull—broad, curved structures ringed with latching pins. Bright spotlights illuminated the hollow cavities as both sides made their final corrections.

Then—contact.

A soft metallic thud reverberated through the ship as the first spoke settled into its cradle. The next followed, then the next, each one locking with a heavy, satisfying clamp. Motors hummed as the articulating ends extended into the mating recesses.

Structural load transferred. Data networks synchronized. Pressure seals engaged.

The *Astraeus* and her habitat ring became one.

Quietly at first, almost imperceptible, the ring began to spin. What started as a lazy rotation gathered purpose, building into a smooth, controlled revolution. Artificial gravity thickened within the ring's corridors as the centrifugal force rose, settling into the familiar near Earth gravity.

Deep aft of the ring the massive flywheel came alive, hidden behind armored bulkheads and radiation shielding. This spin started in the opposite direction, counteracting the angular momentum the habitat ring imposed on the ship. Together, the two rotating masses found their balance, leaving the *Astraeus* perfectly stable.

Now fully assembled, balanced, and awake, *Astraeus* stretched toward the black between worlds. She was now ready for the burn that would send her first to the Moon, a stepping stone to the final Mars destination.



From the command deck, Earth was a fading crescent.

Mike stood behind the helm, hands resting lightly on the console's edge, mag boots locking him in place. Rhea was strapped into the pilot's seat, calm and deliberate as always, her eyes scanning the orbital telemetry. Lin and Sandra worked from the engineering console and science station, their voices a low murmur over the comms as they verified the final thrust parameters.

"All green across the board," Rhea said. "Main Engines ready for Trans-Lunar Injection burn."

"Understood," Mike replied. He glanced once more at the flight display where the blue arc curved away from Earth's orbit, bending gently toward the Moon. "Engage when ready."

Rhea's fingers moved across the controls as she slowly pushed the thrust lever to the three-quarter position.

Outside, the *Astraeus's* engines flared to life. First a pulse, then a sustained roar rippled through the hull like the deep breath of a living thing. The planet fell away behind them, shrinking into memory.

"Main burn complete," Rhea announced after a moment. "Course locked. Rendezvous with the OTV in 2 days."



The Flight Readiness Board convened in a modest hall in Geneva adjacent to the Mission Control Center, a room perfectly sized to discourage the professional meeting attendees. The walls were matte black, broken only by embedded displays and the austere seal of the Warp Drive Consortium. Around the curved table sat representatives of the WDC, Fleet Command, and a scattering of engineers whose reputations carried more weight than their titles. This

was the last room where history would either move forward or stop cold.

Director Halverson stood alone at the center podium. His hands rested lightly on the edge of the lectern as the final projection resolved behind him, the clean silhouette of *Eos* rotating slowly in virtual space.

“In summary,” Halverson began, “*Eos* is fully integrated at *Kepler*. Warp coils installed, field generators verified, power routing validated. We are on schedule for warp drive activation pending final test authorization from the board.”

A Fleet Command vice admiral leaned forward, fingers steepled. “Director, let’s address the elephant in the room first. Why was *Astraeus* removed from the test program so late in the integration?”

Halverson didn’t hesitate. “Because *Astraeus* was never meant to be a test article. She was a pathfinder. *Eos* was designed for this role from the keel up. When the opportunity presented itself, changing direction wasn’t a risk. It was a correction.”

A murmur moved through the room.

“You’re saying years of preparation were expendable?” said a WDC board member.

“I’m saying they weren’t,” Halverson replied evenly. “Every lesson from *Astraeus* went straight into *Eos*. Integration on *Eos* has been flawless. No structural compromises. No power shortfalls. No control instabilities. The uncertainty that remains is not with the vehicle.”

“Then where is it?” the admiral asked.

Halverson answered bluntly, “With the researchers.”

That cue was all the chair needed. “Let’s hear from the ICWR team.”

The lights dimmed slightly as the center display shifted. The scientists appeared on a live link from a conference room at the test facility across town, their posture tense in the way of people unaccustomed to this level of briefing.

Dr. Moravec spoke first. “Our concern is not with *Eos* as a platform. It is with the warp control solution itself. The new logic performs exceptionally in simulation and our testing. In fact, it performs better than any solution we’ve observed in decades of work.”

“Then what’s the problem?” someone asked.

“The problem,” Ilya said carefully, “is that we do not understand why.”

He gestured, and plots filled the screen. Smooth, elegant curves. Field stability bordering on perfection.

“The *Astraeus* produced equivalent results from its final final simulation. No divergence. No instability. And yet the control logic does not reference the established models. It operates without boundary conditions we consider fundamental.”

Dr. Covington leaned in. “In other words, it works too well.”

A Fleet engineer frowned. “You’re asking us to delay a test because something worked?”

“We’re asking you to delay because we cannot explain the success,” Ilya replied. “We now consider the outcome of the *Eos* flight test...unpredictable.”

A pause settled over the chamber.

Then Dr. Vale stood and spoke from the back of the room.

He did not look at the data for long. When he spoke, his voice was calm, almost conversational.

“There is nothing anomalous here,” he said. “The solution derived by the AI represents an emergent optimization. It

bypasses unnecessary abstractions. That is why it appears unfamiliar.”

Ilya stiffened. “All opinions are welcome but, respectfully, you have not participated in our test program.”

Vale smiled slightly. “No. But I’ve reviewed your data. Extensively.”

“You accessed restricted datasets without our knowledge,” Dr. Köhler said, color rising in her cheeks, immediately regretting it.

“With authorization,” Vale replied smoothly, turning his attention back to the board. “The warp field is stable. Reproducible. Safe. You are mistaking apprehension for prudence.”

He spread his hands. “Every major advance seemed impossible until it worked. This one works.”

The room was quiet now. Halverson said nothing. He didn’t need to.

The chair of the FRB released a controlled breath. “We’ve heard enough for today.”

He looked around the table, meeting eyes one by one.

“The board is not prepared to render a decision. We’ll reconvene in thirty days after we’ve had time to consider what’s been presented.”

The ICWR scientists visibly sagged with relief. The WDC board members in the audience were noticeably distraught. Every delay was costly.

“Meeting adjourned.”

Halverson gathered his notes as the room began to empty, his expression unreadable. Thirty days was not a rejection. But it wasn’t a victory either.

CHAPTER 21



The Orbiting Tanker Vehicle had launched days earlier from the Moon's refinery platform, lifting silently into orbit with the tanks packed full of deuterium, the quiet currency of fusion flight. Uncrewed and utilitarian, it waited now in orbit, a blocky silhouette against the stark gray below.

Astraeus approached on RCS thrusters, her long hull sliding into alignment with practiced restraint. Docking beacons painted the tanker in bands of red light as the ship bled off the last traces of relative motion. A fueling boom unfolded and mated cleanly with *Astraeus's* fuel port. Seals engaged, pressures equalized, and fuel began to flow.

On the *Astraeus* command deck Rhea was monitoring the fuel transfer from the engineering station. For a few quiet minutes, everything looked nominal. Then the temperature along the line began to drop rapidly, the flow rate stuttering as ice began to form inside the umbilical.

Rhea recognized it immediately. She'd seen it before—a common fault of the OTVs. The transfer line had frozen, and it meant an EVA to thaw it manually.

"Transfer line's frozen again," she told Mike sitting across from her at the captain's station. "I'll need to EVA to free it up."

"Copy, I'll monitor the op from here."



Minutes later, Rhea was floating outside *Astraeus*, tether line trailing behind her. The Moon hung below, vast and desolate. She guided herself hand over hand toward the frozen section of the umbilical, boots finding purchase on the hull when she needed them.

She anchored herself, pulled the heater unit from her kit, and clamped it around the frosted line. From her vantage point she could see the OTV external status panel, showing the typical red indicator for blocked flow. She powered up the heater unit. Slowly, stubbornly, the ice surrendered.

A thin tremor passed through the line as the blockage cleared.

“Flow restored,” Mike reported from the bridge. “I’ve never seen the flow rate TM look this stable.”

Rhea smiled inside her helmet. “You’re welcome.”

Rhea was just about to head back to the airlock when she realized the red light was now flashing, not completely out as with previous thawing ops. She frowned. She’d done this job too many times to ignore the feeling in her gut. Maybe it was just a software update that had changed the light function, but flashing red didn’t make a lot of sense to indicate normal operation.

“Mike,” she said, “I’m seeing something odd on the OTV status panel. Going in for a look.”

“Copy.”

As she worked her way along the fuel line towards the panel, she could feel the familiar vibration of the line as it ramped up to full rate. At that moment, she noticed the light start flashing faster.

“Mike,” she said, her concern now elevated, “this is not normal behavior for the status panel. We need to get clear. Maybe send maintenance up here to take a closer look.”

“Rhea, say again?”

She was already retreating, hauling herself back along the tether. Panic was setting in, the flashing lights, the too clean telemetry, even the vibration in the line didn't feel quite right.

“We need to disconnect and get out of here. The quicker the better.”

“Copy that.”

The instant she cleared the airlock, Mike killed the fuel transfer and commanded the OTV to retract the boom. *Astraeus* fired her RCS, pulling away hard.

They were already kilometers out when the tanker detonated, tearing itself apart in a brilliant, instantaneous emerald flash.



The *Astraeus* would remain in Moon orbit for at least another week while the investigation ran its course. Mike encouraged the crew to make use of the time and take a shuttle down to the surface for some R&R. It would be the last opportunity for open space before another long stretch confined to the ring.

He arranged for Helena to tour the Lunar Test Range. She invited Rhea along. They had met a handful of times during Helena's visits to *Kepler*, and Helena was curious. Rhea had spent more hours beside Mike over the past five years than she had. It might be enlightening to compare notes.

The LTR was not that interesting to Helena. Once the novelty of standing on the Moon in the low-g environment wore off, the facility revealed itself as entirely utilitarian. Most of it lay buried beneath regolith shielding. Long corridors of endless servers and relay banks. The control

center was only half submerged, its broad glass canopy offering a panoramic view of the gray horizon. That, at least, was beautiful in a macabre way.

Several controllers they passed during the tour stole glances at Rhea. A few were less subtle. Word had clearly traveled about her role in saving the *Astraeus* during the OTV mishap. On the Moon, news traveled fast. New faces were rare.



The isolation on the Moon weighed heavily. The endless gray landscape pressed inward. The population was small, turnover rare. Routine hardened into permanence.

So when Rhea and Helena stepped into the underground bar carved into the bedrock below the facility, conversation dipped. Regulars stared openly. Within minutes, someone quietly covered their drinks.

They settled into a booth beneath a low arch of exposed stone with a view of the bar. The place immediately reminded Helena of the wine cellar back home. Rock walls had a way of collecting moisture, even on the bone-dry Moon, leaving the air faintly damp. The steady echo of music and voices filled the room. Though not very loud, it still made conversation difficult.

“So,” Helena began, cradling her glass, “have you been to Mars before?”

“Once,” Rhea replied. “*Astraeus* stopped there for fuel on our way to survey the asteroid belt.”

“What’s it like?”

Rhea considered that. “Like nothing on Earth.”

Helena smiled.

“If you don’t mind me asking, why did you decide to come on this mission?” Helena asked.

“Sorry, I didn’t catch that.”

“Why did you come on this mission?”

“I guess I just couldn’t break up the band,” Rhea said lightly.

Helena studied her for a moment. “I sense Mike’s using this mission to keep working the warp controller problem.”

Rhea took a moment before answering. “Probably. I suppose it was my error that started us down that road.”

Helena blinked. “Really? Mike never mentioned that.”

“He wouldn’t.” Rhea’s voice softened. “He thinks every problem is his to fix. Tries to shield everyone from their mistakes.”

A hint of recognition crossed Helena’s face.

Rhea noticed. “Lena, you’ve got nothing to worry about. The rest of the mission will run smoothly.”

Helena arched a brow. “Didn’t we almost explode a few days ago?”

Rhea shrugged. “Those OTVs are space junk. Something like that was going to happen eventually.”

Helena hesitated, then leaned closer over the table. “Do you think we’re really out here so the WDC can quiet Mike’s concerns?”

“Maybe.” Rhea looked down at her glass. “I try not to think about it. Speculation clouds judgment. Out here, that’s dangerous.”

Helena sensed the boundary. Rhea was guarded.

That was fine. She was the captain’s wife now. Things were unavoidably different.

Nevertheless, it was pleasant simply to be out, to feel the hum of music, the low murmur of conversation, the

unmistakable attention of young techs who suddenly found their evening more interesting. Helena's beverages were nonalcoholic, but she was still enjoying the atmosphere.

Across from her, Rhea's weren't, and she seemed to be loosening up a bit. Her attention had left the table and was now focused on one of the more attractive men sitting at the bar.



The investigation ran its course. The explosion was a clear act of sabotage, yet no one claimed responsibility. Someone on the Moon had deliberately turned the OTV into a bomb during prelaunch servicing. The working theory was grimly elegant. The auto trigger was tied to maximum fuel flow. Once the ice cleared and the line reached peak transfer, the countdown began. That explained the delay that had fortuitously allowed *Astraeus* to clear the blast radius.

Out of caution, the ship underwent a full inspection, bulkhead by bulkhead, conduit by conduit. Nothing was found. Still, the crew, many with families aboard, remained shaken. Everyone understood how close it was. If not for Rhea's vigilance, none of them would be here.

The OTV had transferred enough deuterium before the detonation to complete the mission. That fact only sharpened the impatience. When clearance finally came through from the investigation team, it felt less like permission and more like release.

Mike took his familiar place behind the helm, Rhea already settled at the controls.

"Main engines ready for Mars transfer," she said.

“Copy,” Mike replied. He looked out at the viewport’s HUD overlay, the yellow trajectory arc now stretching cleanly from lunar orbit toward Mars, the stars sharp and unmoving.

“Engage when ready.”

The drive came up smoothly, the low hum steady into something almost reassuring—a heartbeat in the quiet.

“Helm to all decks,” Rhea said, her voice calm, edged with pride. “*Astraeus* is outbound. Trajectory confirmed. Mars arrival in forty-two days.”

Mike let out a slow breath. “Plenty of time to settle in.”

From the engineering station of the command deck, Lin’s voice drifted forward, dry as ever. “That’s still plenty of time for more things to go wrong.”

The *Astraeus* pressed on, bound for Mars, and whatever waited beneath the red horizon.

CHAPTER 22



Vexa and Jacob sat shoulder to shoulder at the underground bar, letting the weight of the place settle in. The gravity felt Earth-normal here, provided by the slow, unseen spin of the habitat. It was a comfort, even if neither of them was in a mood to appreciate it.

They'd just heard from Director Duval.

Furious didn't begin to cover it. The message was short, sharp, and final. Terminated. Both of them. As if the chain of events that led to Dr. Voss's death hadn't been set in motion by Duval himself.

Vexa was staring at the bartender as he poured a glass from the tap. The beer flowed with a slight bend, a subtle reminder that nothing here ever behaved quite the way it should.

She tipped back her drink. "You going to miss this place?" she asked Jacob. "When we head back to Earth, I mean. Or are you just pretending you won't miss Sera?"

Jacob didn't look at her. "I don't know what you're talking about."

"Sure you do," Vexa said. "I've never seen you look at someone like that. Even though she's not your type."

He snorted. "Not my type?"

"Smart. Beautiful."

"Stop."

She smiled into her drink. “You know, I’ve always had a thing for Martian women. The men, though, I like them Earth-born. Like you.”

He shook his head. “Nothing’s going to happen. She’s way out of my league.”

“Maybe,” Vexa said. “Or maybe you’re just bad at reading trajectories.”

Before he could answer, a shadow fell across the table.

One of the shuttle pilots stood there, jacket half-zipped, posture casual in that carefully practiced way. They all carried themselves like fighter jocks from a century ago—ironic, given it was the miners who lived with real risk.

“Hey, Vexa,” the pilot said. “You ever going to take me up on that ride I promised?”

Vexa raised an eyebrow. “What kind of ride we talking about?”

Jacob sighed, already retreating into his glass, as the pilot pulled up a chair and smiled like he already knew the answer.



The usual hum of equipment filled the science lab. It was the usual cold, the quiet broken only by the occasional hiss of recycled air. Sera stood over the main console beside Lionel and Rafi, whose injured leg rested awkwardly on a support cradle. The recovered quantum data crystal rested on the analysis platform, its surface swept by the steady pulse of a scanning laser. A young tech hovered nearby, fingers flying across a translucent display as streams of scrambled data scrolled in rapid succession.

“Try modifying the sync pattern,” Lionel said, leaning closer. “The interface is still dropping packets.”

The tech made the adjustment. For a long moment, nothing happened, then the data locked, stabilizing into clean lines of hexadecimal text.

“There,” Sera whispered.

The feed began decoding the ancient data into structured files. The translation AI churned, discovering the text encoding first, then comparing the alien characters against every known language in the Terran archives, assembling syntax from probability and inference. Folders and filenames began to form.

“Administrative records... maintenance logs... city maps,” Lionel murmured. “It’s all civic data.”

Sera leaned closer as a new directory appeared—digital signage. She hesitated, then opened the folder and selected a file. The display switched to video—shifting light, motion, sound.

A broadcast.

The screen came alive with the ancient feed: news anchors, a man and a woman, seated before a crystalline backdrop. They looked surprisingly human—perhaps slightly smaller in stature, with porcelain-toned skin and hair in lighter shades, strikingly beautiful to the human eye.

Subtitles appeared across the top of the screen as the translation AI struggled to keep up. Headlines scrolled across the bottom: financial data, weather updates, possibly sports scores. Then the feed cut to a short feature: a sleek spacecraft suspended in a space station testing bay, an energy field arcing around the curved hull.

“Preparations near completion for the first superluminal field transit,” read the translated caption.

The room fell silent. Sera looped the video once more, and froze the image of the ship mid-frame. The scene was somehow both strikingly familiar and yet impossibly alien.

She released a short breath, her voice barely audible. "They were about to test a warp drive."

No one spoke. Only the hum of the equipment filled the room, heavy and endless.

Finally it was Lionel who broke the silence, "Sera, we might be a little out of our league here."

Sera answered, "Yeah, that's why the IRC is sending help."

Rafi responded with mild concern, "Help, what help?"

Then the console comm chimed before she could respond.

"Jacob?" Sera said, activating the channel.

His voice came through, tight with emotion. "Just wanted to let you know I'm heading back to Earth. Duval's fired Vexa and me for what happened at the site."

Sadness touched Sera's face, brief and unmistakable. She hid it too late.

Rafi barked a humorless laugh. "Forget Duval. You saved my life." He glanced at Sera, then back at the comm overlay. "You and Vexa work for me now. Double whatever you were making. Effective immediately."

"Rafi, you don't have to—"

"Not a favor. A project. I'm funding a proper restoration of that site." He paused, his expression softening. "What's buried down there deserves better than corporate greed."

The transmission clicked off, leaving the team staring at the frozen image on the display—the ancient ship shining in the broadcast light, suspended in time.

CHAPTER 23



The *Astraeus* drifted through the quiet between worlds, her main engines idle, awaiting the upcoming braking maneuver. The ship coasted in perfect stillness, gliding along her trajectory toward Mars. Only the pulses of the reaction control thrusters broke the darkness, appearing as brief sparks of blue-white light that nudged her back on course before fading into the void.

Along her midsection, the habitat ring turned with patient precision, its slow rotation casting a rhythmic shimmer across the hull. Sunlight caught the edges of the spinning structure, flashing gold against the black as though the ship herself were breathing.

The soft, steady hum of the ship's fusion reactor carried through the hull like a heartbeat. Deep inside the maintenance network, Lin was wedged in a Jefferies tube with a diagnostic pad balanced on one knee, his gloved hands buried in a cluster of fiber lines.

"Alright, Rhea," he said over the comm. "Go ahead and bring the FSA power bus online. Let's see if the mod holds this time."

On the bridge, Rhea sat at the science console, fingers gliding over the controls. "Copy that, Lin. Powering up... now."

A subtle vibration ran the length of the ship as the Forward Sensor Array drew power. Rhea checked the diagnostics, watching the green bars scroll upward.

“Power stable,” she reported. “No fluctuations in the distribution network.”

Lin attached the cover to the last open panel. “Good. Phase modulation is in sync. We’ll need to run another ops check once Sandra’s got the new software patched in, but I think we’re good to go.”

Rhea leaned back, stretching. “Music to my ears. You’ve been living in that tunnel for three days.”

“Yeah, well, it’s quieter in here,” Lin said. A muffled clang echoed as he pushed himself backward through the tube. “Fewer opinions.”

Rhea smirked. “Don’t let the Captain hear you say that.”

“Wouldn’t think of it.” He paused, checking one final status line as the diagnostic pad chimed. “Alright—final readout’s green across the board. FSA is now a fully operational deep space dark matter ion detector.”

Rhea tapped a few commands and locked in the new configuration. “Copy that, Chief. FSA checks complete. We’ll hand off to Sandra for initial ops check and baseline scans.”

Lin smiled faintly, the sound of the comm link crackling softly in his ear. “I gotta hand it to Mike, I wasn’t sure this could work.”

“Believe it.”

Static popped once more before the line went quiet.

Rhea sat back, watching the slow drift of Mars through the forward viewport—a pale red disk growing brighter by the day.



The underbelly of the *Astraeus* came alive with movement, panels unfolding along the ship’s prow like the petals of a

metallic flower. From within, the FSA extended on its articulated spine, a lattice of precision mirrors and sensor vanes sliding into perfect alignment. Actuators hummed as the assembly rotated, finding its mark among the stars.

On the command deck, the lights dimmed to mission mode. Sandra watched the display at the science console where the bore-sight camera feed came into view showing a field of cold starlight framed by the array's sensor housing. Subtle telemetry overlays began to scroll down the screen: spectrum readouts, radiation counts, gravitational flux data.

A faint hum reverberated through the deck as the array powered to full sensitivity. Outside the hull, invisible waves of dark matter photons washed over the sensors.

"FSA now aligned with target coordinates—right ascension twenty-one hours, declination forty-two degrees north."

Mike nodded, eyes fixed on the holographic overlay hovering above the command pit. The map zoomed into a sector of the constellation Cygnus, a faint digital marker pulsing near the sixth planet of a dim yellow star.

"Candidate Planet Six," Sandra said softly. "Hawk's find."

"Yeah," Mike replied. "Let's see if the signature's still out there."

Rhea smirked faintly. "If it ever was."

"Only one way to find out," Sandra said, tapping the console to begin the calibration sequence. "Initiating data acquisition. Beginning spectral sweep across the dark-matter ion bands."

Lines of data began materializing across the holographic display: dense, multicolored noise resolving into recognizable structure. Sandra left the science station to join the others at the command pit.

“There,” Sandra whispered. “Just above the noise floor—that spike. Same signature as before.”

Rhea pulled the data into a secondary plot. “It’s faint.”

Mike’s expression tightened. “Hawk picked it up while the DMD was repositioning. Maybe we’re seeing the tail end of whatever that was.”

Sandra’s fingers moved across the command pit controls, isolating the signal. “It’s still coherent—that’s not random interference. But the amplitude’s dropping.”

“Decay rate?” Mike asked.

“Unclear,” Sandra said. “If it’s the same source, it’s fading...I suspect it’ll be below detection threshold in a few days.”

Rhea leaned back, exhaling. “So we found it—and we’re already losing it.”

Mike folded his arms, staring at the faint trace in the holo. “Set the FSA for continuous autonomous monitoring. Full spectrum, same region. If the Swannies warp again, I want to know before we hit Mars orbit.”

Sandra nodded, already queuing the command sequence. “Configured for 24-hour rotation. It’ll log and notify us if anything interesting pops up.”

Rhea shot Mike a glance. “And what if it never shows up again?”

Mike’s expression softened, but only slightly. “It will.”

CHAPTER 24



The hum of the ship filled Sandra's quarters, low and steady, almost forgotten. She sat at her console reviewing data from the latest FSA runs when a soft chime broke the monotony.

INCOMING: SECURE TRANSMISSION, MMC SCIENCE LAB, COPRATES CHASMA, DR. SERA KHATRI

This was the call she'd been waiting for. Finally, she'll understand what her assignment on Mars is really about. She accepted the call, and the display resolved into the image of a young woman framed by sterile lab lighting and the faint red dust of Mars clinging to everything in view.

"Dr. Vaziri," Sera said with a tired smile. "It's good to finally speak with you."

"Likewise," Sandra replied. "I wasn't told much beyond that I'd be joining your team. Something about an urgent discovery?"

The *Astraeus* was still several weeks out from Mars so the transmission delay lasted several minutes before Sera's face returned to the display.

She began with a slight hesitation, as if trying to decide where to begin. "That's putting it mildly," she said. "Six months ago, a MMC mining unit uncovered a buried structure in the Coprates Chasma basin. At first, we thought it was just fractured basalt—until the instruments picked up straight edges and uniform composition. Then we found an

entrance. A small city—or what’s left of one. Radiometric dating puts the structure at 3.7 billion years old.”

The words didn’t compute at first. Sandra blinked, trying to process them. The transmission continued.

“The site was sealed under ice after some kind of catastrophic event—maybe an aerial impact or a tectonic collapse. Whatever it was, it happened fast enough that the entire city collapsed under ground and the basin flooded almost immediately. The planet cooled quickly and turned the flood waters to ice. That’s likely what preserved it.”

She continued, her expression tightening. “A few sols ago, we tried to reach what we think was a central data center. The structure collapsed while we were inside. We lost the platform shaft and nearly the entire crew. I was lucky. One of the potential investors didn’t make it out.”

“We recovered only a fragment of their systems—nothing from the main data center. But...” Sera turned to retrieve something from the lab bench behind her. When she came back into view, she held up a small, translucent crystal, edges chipped, surface faintly iridescent.

“This was found inside what looked like a public terminal—a kiosk, maybe,” Sera said. “A quantum data crystal. We managed to pull the data. The language wasn’t difficult to interpret, the code appeared to be binary, unencrypted, so our systems processed the information rather quickly.”

Sandra’s watched intently as Sera continued.

“We found administrative records. Building directories. Maintenance logs. A city map.” Sera hesitated. “Then we found localized broadcast data—something akin to a news feed. Probably what the kiosk displayed while idle. It was mostly trivial content, but one fragment stood out.”

She tapped a console, and the frozen video image of the alien ship appeared beside her.

“The translation isn’t perfect yet,” Sera continued. “But it refers to a milestone event. A technological breakthrough. It appears they were preparing to test something called superluminal field transit. We think they were on the verge of developing a warp drive.”

“And if that weren’t shocking enough, the structures show damage consistent with impact from above, which had to happen before the city was buried.”

The transmission paused as Sandra sat in stunned silence. She finally spoke, voice low. “This is why the IRC sent me.”

Minutes later Sera appeared again and nodded once. “They said you’d have insight into what we’re looking at—that maybe you’re the key to unlocking the mystery.”

"Doubtful..." Sandra murmured to herself. When Sera’s transmission finished, Sandra straightened, her expression sharpening. “Transmit all your findings. I’ll start the analysis before I make orbit.”

Sera returned several minutes later.

“It’s already on the secure uplink,” she said. “And, Sandra...the IRC wants to keep this confidential. We look forward to seeing you.”

The transmission ended, leaving the cabin quiet except for the hum of the ship. Sandra stared at her reflection in the darkened screen.

She whispered to herself, almost afraid of the answer:

“What have we done?”



Sandra's display still glowed with the the last image from Sera's transmission—the three dimensional wireframe scan of the buried structure.

The screen flickered. Mike's face appeared, slightly backlit by the warm lighting of the ready room. She didn't hesitate to call him. Confidential did not mean keeping anything from her captain.

"Mike," Sandra began, her tone edged with unease. "Do you know what's happening on Mars? I mean, why the IRC sent me?"

He studied her for a moment, then leaned back in his chair. "You mean the destroyed city found under the ice?"

Sandra's eyes widened. "You know?"

A small smile tugged at the corner of his mouth. "The IRC isn't exactly renowned for keeping secrets. Word travels fast through WDC channels."

She leaned closer to the display. "Did you also hear they found a quantum data crystal? The team managed to decode it. It contained...a news broadcast announcing the pending test of their first FTL drive."

Mike's expression changed. His faint smile vanished. "Now that," he said slowly, "I didn't know."

Sandra took a breath. "It's impossible, Mike. But the timeline, the evidence—it all points to the same conclusion. This civilization reached the threshold of warp travel...and then, suddenly, they were gone. The entire city buried under rock and ice, as if something hit them from orbit."

Mike frowned, thinking. "You're suggesting they were destroyed because they developed warp capability?"

"I'm saying the coincidence is concerning," Sandra replied. "They lit the fire, and someone put it out. If we can detect warp signatures, so can others. We've already proven that."

Mike breathed out slowly, rubbing his chin. “Sandra, that’s a massive leap. Even if your theory’s right, why would any civilization go to that length? What’s the motivation for wiping out anyone who develops FTL?”

“I don’t know,” she said quietly. “Maybe it’s a warning system. Maybe it’s containment. Maybe we’re just...not supposed to.”

Silence hung between them.

Finally, Mike spoke. “The *Eos* warp flight is still weeks out. That buys us some time. I want to get to Mars and see this for myself before jumping to conclusions. We can’t take this to WDC without something solid.”

Sandra nodded, though worry still clouded her expression. “Agreed. But if you’re wrong, and activating warp drive is what triggers whatever happened to them—”

“Then,” Mike said, his tone firm, “we make damn sure we stop that test.”

The comm line went quiet for a moment before she ended the transmission. The image of the frozen city popped back onto her screen, a fractured structure beneath layers of ice, a portent from a world long gone.



The corridor lighting dimmed to the ship’s night-cycle hues of soft amber and blue casting long shadows along the bulkheads. *Astraeus* glided in steady silence, the faint periodic vibration of RCS the only sign of motion.

Sandra hesitated outside her sister’s door, thumb hovering over the chime. She shouldn’t be doing this. Her instructions from the IRC were clear. Keep the information confidential. But she wasn’t cut out for this, not trained like the others.

And after the last conversation with Mike, the weight of everything pressed down on her chest like the ring's own gravity.

She exhaled and tapped the control.

The door slid open to reveal a cozy, cluttered cabin. Clothes still unpacked. A half-eaten ration tray on the small table beside an open display streaming some old Earth serial. Her sister Cora Vaziri sat cross-legged on the bed, wearing a worn *Kepler* sweatshirt two sizes too big.

"Sandy," Cora said, grinning. "Finally off the clock? I thought being a hotshot science officer meant getting to relax once in a while. Tell others what to do."

Sandra stepped inside, letting the door seal behind her. "I need to talk to you," she said quietly.

Cora's smile faded. "Okay...what's wrong?"

Sandra paced the small space, glancing at the walls like she half-expected someone to be listening. "You can't repeat this. To anyone. Not to the other passengers. Not to the crew. Promise me."

Cora sat up straighter. "You're kind of scaring me. What's going on?"

Sandra turned toward her, lowering her voice. "You know that research I was doing with the DMD on *Kepler*—the dark matter detection array?"

"Yeah, the one that ate up months of your life then got you sent to Mars."

"Well," Sandra said, choosing her words carefully, "it led to something else. The IRC actually sent me to Mars for a reason. There's...a site there. A buried city—alien, ancient. The team on the ground found evidence it was destroyed right after they developed warp drive."

Cora blinked, then laughed nervously. “Okay, that’s not funny.”

“I’m not joking,” Sandra said. “They found a quantum data crystal—a record. The civilization was on the verge of faster-than-light travel when it all ended. Their city...just collapsed under ground then flooded, frozen in time.”

Cora’s face went pale. “You’re telling me you think someone, or something, wiped them out for trying to go faster than light?”

“We don’t know for sure,” Sandra said. “But it’s possible. And if it’s true, then our upcoming warp drive test on *Eos* could put us in the same crosshairs.”

Cora stared at her sister, eyes wide, the playful energy gone. “I thought this was supposed to be a vacation, Sandy. A trip to Mars, a chance to see the domes, drink terrible coffee, and watch you geek out at rocks.” She shook her head slowly. “Now you’re saying I’m on a ship heading straight into something that could determine the fate of humanity?”

Sandra looked away, guilt tugging at her expression. “I shouldn’t have told you. But I couldn’t carry it alone.”

Cora swung her legs off the bed, standing beside her. “Well,” she said, managing a small, shaky laugh, “if it’s the end of the world, at least I’m with my sister.”

Sandra cracked a faint smile. “I’m sure it won’t come to that.”

The sisters stood in silence for a moment, the steady hum of the spinning habitat ring filling the room. Outside, Mars shimmered faintly in the distance, growing brighter with every passing day.

CHAPTER 25



Mike stepped off the command deck and into the dim corridor of the ship's spine. The moment the hatch closed, the buzz of activity faded, allowing the noise in his head to return.

Mars. The data crystal. The silent city apparently crushed from the sky.

They built an FTL system...and then they were gone.

It sounded like conspiracy theory when spoken aloud, nothing but fringe paranoia. But the evidence was mounting. Preserved across eons of cold dust. Hopefully, somewhere in the ruins of that dead city was something that would leave no doubt. The Martians reached for the next frontier, and then their world burned.

He swallowed against the dryness in his throat.

Then there was Hawk.

The situation on Mars was disturbing enough. But an AI, something they contrived, something he was responsible for integrating, solved a warp-control problem none of them could reverse engineer.

He reached the transfer junction, an iris door leading into the annular corridor that wrapped the pressure hull. Inside, the tunnel curved away in both directions, a ring of composite plating and recessed lights. A two person transfer sled hung from the wall: a simple platform with harnesses and magnetic restraints.

He stepped onto it, clipped himself in, and braced as the locking clamps disengaged. The sled rolled free on the track, drifting a few centimeters before the motors nudged it forward. A soft whine built under his feet as the sled began spinning up. The world rotated around him, at first gently, then steadily.

The sensation always tugged at his stomach, a reminder that humans weren't designed to switch reference frames in mid-stride.

How do I inform Halverson?

That was the question circling tighter than the annulus around him.

He suspected Halverson was already on thin ice with the WDC board after the *Astraeus* integration failures. Dropping this on him would sound like stress-induced nonsense. Worse, it would make Mike look unhinged.

The hatch swayed gently in his view until the sled matched the habitat's rotation and aligned with the access tunnel. A green strip illuminated overhead. The hatch opened, revealing the passage to the habitat ring.

Mike released the harness and pushed lightly forward, drifting into the tunnel. The handrails spiraled along the walls, a slow corkscrew guiding him downward, or was it upward? He caught one and pulled himself along the helix, body floating, legs trailing behind. With each meter, the faint tug of rotation grew.

His thoughts spiraled with him.

What if the Martians weren't destroyed by war or environment or cosmic accident? What if the catastrophe is baked into the physics and Hawk changed the pattern anyway?

He tightened his grip on the handrail.

Halverson needs to know. It's his primary responsibility to assess risk.

But telling him meant admitting Mike didn't understand either. That his concerns were based on gut feeling more than verifiable evidence. It meant risking his career, his credibility, everything he'd spent years building.

The handrail's pull became heavier as artificial gravity strengthened. The spiral dissolved behind him and the tunnel opened into the wide, curved corridor of the habitat ring.

He walked the last stretch. His cabin door waited at the bend. He stopped and stood there for a long moment.



Mike keyed open the door, exhaustion written in every movement.

Helena looked up from the couch, one hand resting absently on the curve of her abdomen. Her face brightened with a tired but genuine smile.

"Hi, honey," she said softly. "How was work?"

He smiled faintly, an automatic, practiced smile that didn't quite reach his eyes, and dropped his flight jacket on the chair. He crossed to her, leaned down, kissed her forehead, and stayed there for a beat longer than usual.

Her smile faded. "What is it?"

He hesitated, ran a hand through his hair, and sat beside her. "I had a concerning conversation with Sandra today."

"The science officer?"

He nodded. "We talked about what she's learned about the site on Mars. She finally got her mission brief. It's not just a city buried in ice, Lena. They found a data crystal. It's...a warning, maybe. The civilization reached the threshold of

warp capability and then they were gone. Wiped out. Nothing left.”

Helena’s brow furrowed. “You think they were destroyed? Because they tested the drive?”

“I don’t know,” Mike said. “Sandra believes it’s possible. I’m not ready to believe that yet, but...” He stared down at the floor. “There’s something else. The warp controller. The one we’ve been developing. I still don’t understand why it worked. Hawk, the warp controller AI—it learned something, something we didn’t teach it. And whatever that was...it’s hidden. I can’t explain it, and I hate that. We’ve opened a door to the unknown.”

Helena studied him for a long moment, then reached out and took his hand. “Then you need to stop this, Mike. Or at least delay it. Tell Halverson. Tell Fleet. Don’t let *Eos* warp until you’re sure.”

He gave a bitter laugh. “Halverson doesn’t want to hear it. To him, uncertainty is just the noise you filter out of progress. And I can’t go to Fleet Command with ‘my gut says something’s wrong.’ It’s not evidence. It’s not even theory. It’s a feeling.”

“So what?” she said firmly. “You’re willing to risk the fate of humanity because you don’t want to sound unreasonable?”

He looked at her, the weight of her words sitting heavy on him. “It’s not that simple. You don’t know the politics. I’ve already raised too many red flags. They gave me the *Astraeus* command to keep me in check, to keep me quiet.”

Her eyes softened, but her voice didn’t. “Maybe. But that doesn’t matter. You’ve always done what’s right, not what’s easy. If you really believe something’s wrong, then you can’t stay silent—not with what’s at stake.”

Mike's throat tightened. He looked at her, really looked, the calm resolve in her eyes, the way her hand unconsciously rested against the life growing inside her.

He nodded slowly. "You're right."

She smiled faintly. "I usually am."

He leaned back, exhaling through his nose. "God, I wish you weren't this time."



The transmission lag was only a few minutes at the *Astraeus*' current position, but long enough for tension to steadily build in the silence between words.

Mike sat at his desk in the ready room, the soft blue light from the comm console reflecting off the bulkhead walls. The WDC insignia pulsed on the screen while the system established a secure link.

Then Halverson's face appeared—crisp, professional, and as unreadable as ever. Behind him this time the familiar view from the Mission Control Center observation wing, another *Eos* integration test likely in progress.

"Captain Renner," Halverson said, leaning forward slightly. "At this hour, I doubt you're calling me to discuss the ethics of weather modification."

Mike gave a faint smile. "No, sir. I wanted to check on *Eos*. How's the warp integration proceeding?"

Halverson's face returned to the screen a few moments later, his tone warmed slightly. "Ahead of schedule. The engineering team's just completed the field activation trials. We're waiting on final authorization from the FRB to proceed to warp activation."

Mike nodded slowly. “And the validation? Have your scientists figured out what Hawk actually did to make the warp field controllable?”

“They’re close,” he said finally. “Dr. Vale issued a white paper detailing his analysis results. It’s under review by the FRB. Hawk’s neural lattice constructed the final equations in a way that, well, it’s beyond my ability to explain—emergent mathematics, the AI equivalent of intuition. But it works. You’ve seen the results yourself.”

Mike leaned forward, voice steady but edged. “That’s what worries me. We’re about to activate something we don’t fully understand. And there’s more.”

He paused, a practiced pause that would provide the intended effect without triggering transmit. “We’ve been briefed on evidence coming from Mars. There’s a buried structure, artifacts, indications of an ancient civilization that may have developed warp capability.”

When Halverson returned a few minutes later his expression hadn’t change. “I’ve seen the reports. Fascinating, but speculative. There’s no real evidence tying that site to any existential threat. Let’s not chase ghosts, Mike.”

Mike’s voice quickened. “But the parallels are hard to ignore. You told me once the point of this project was to secure humanity’s future not risk it blindly. I’m asking you to hold the *Eos* test until we know more. Until I can get to Mars and review this evidence myself. You owe me that much.”

Finally, several minutes later Halverson returned. “All right. Thirty days. I’ll come up with something to tell the board. You’ve got a month, Mike. Find me something solid. If you can’t, *Eos* warps on schedule, and there won’t be anything I can do to stop it.”

Mike nodded. “Understood. I’ll get you what you need.”

The screen went dark.

Mike sat back in silence. He felt better. Halverson actually gave us thirty days. That should be enough. Thirty days to find proof that might prevent what was beginning to feel like fate.

CHAPTER 26



The ship drifted through the ink of interplanetary night, the hull illuminated by the faint shimmer of reflected sunlight. The *Astraeus* was silent except for the murmur of systems checks and the low hum of the fusion reactor deep in the ship's spine.

Mike stood beside the central holo, arms folded, while a projection of the FSA's latest dataset cascaded in bands of light. Sandra leaned over the display, her expression tight. She had the look of someone expected to explain the unexplainable.

"The latest data from the FSA just came through," she said. "Still locked on the same region near Planet Six."

Mike nodded. "Any change in the warp signature?"

"Not exactly." She adjusted the display, expanding a section of the spectral analysis. "The original signal's still there—barely, decaying, almost gone. But there's a new signature, about ten AU, similar displacement to the original. This time there's a region where the dark matter density drops to zero. Nothing. Like it's being displaced or... consumed. And it's moving, rapidly."

Mike frowned. "A gravity well? Moving?"

"Yes." Sandra zoomed in again, eyes narrowing. "And at this specific incidence angle, the dark matter signal didn't disappear—it spiked. Amplified. It's as if something is bending the field itself. I can't explain it."

Mike watched the light pulse in the display, a faint spiral pattern hovering between them. “Could that be what an active warp signal looks like?”

“Maybe,” she said, hesitant. “The gravity well is too ordered, too precise to be random. If it’s a natural occurrence, it’s the most unnatural thing I’ve ever seen.”

He studied her face. The unease in her voice wasn’t just scientific curiosity. “You’re still worried about *Eos*,” he said.

Sandra looked up. “You don’t get it, Mike. If that void represents what happens when a warp field interacts with local spacetime, it’s not propulsion—it’s erasure. A total absence of dark matter means the field’s stripping it away, displacing the very fabric the universe rides on. That’s not travel. That’s annihilation.”

After a moment he responded. “I got us thirty days. Halverson delayed the test.”

Sandra blinked. “He did?”

“Yeah. But we need something concrete before then. Whatever this is, this signal, the gravity well, there has to be a pattern. Something that proves it’s connected to the events on Mars.”

She nodded, gaze returning to the floating data. “Then we keep looking. There’s something here, I can sense it.”

"And Sandra, contact MIT. See if we can get the DMD on *Kepler* to confirm the finding. Maybe the IRC can give us leverage."

Before she could reply, a harsh klaxon tore through the bridge:

PRIMARY FUSION REACTOR ALERT. CONTAINMENT
PROTOCOL ACTIVATED.

HABITAT RING SEPARATION SEQUENCE INITIATED. CBF BRAKING ACTIVE.

The hologram stuttered out of existence.

Sandra's voice broke through the chaos. "My sister—she's on that ring!"

Mike forced his voice steady. "We all have family on that ring. Ring release is standard for a reactor anomaly. Stay focused."

He straightened, slipping into command mode. "Rhea, report!"

Rhea was already at the engineering console. "Emergency shutdown in progress! Fusion containment is unstable. Ring separation underway!"

He hit the comm. "Engineering, talk to me!"

Lin's voice came back ragged, layered with the hiss of background alarms. "We've got a coolant failure in the reactor core! Pressure drop forced auto-quench. Plasma arc is shutdown...but the heat load's still too high."

"Get on it!"

Multiple warning tones pulsed through the *Astraeus* bridge, a low mechanical heartbeat growing more frantic by the second.

Out the massive forward viewport, the now detached spinning ring could be seen wobbling in a widening, nauseating precession. A single RCS thruster stuck at full burn kept driving the ring harder off-axis as the pulsing of the functioning jets tried to stabilize the wobble.

Rhea settled herself as the ring telemetry took another hit. "We just lost ring TM again. Three second blackout. That wobble is getting worse."

Mike scanned the incoming numbers: torque buildup, propellant flow, structural loads.

“If that thruster keeps firing,” he said, “the ring’s going to drain the maneuvering tank dry.”

“The thruster’s not responding to command. We don’t have any techs on board that can disable it manually,” Rhea added.

“Then we find someone.” Mike stepped closer to her station. “Pull the manifest. Anyone with technical training. I don’t care what they worked on.”

Rhea ran the query. The list scrolled: tourists, miners, family. Nothing helpful. Then—

A single name blinked in amber.

ZHAO, WEIMING—spacecraft mechanic, retired, Gobi Anchoryard

Rhea’s eyebrows lifted. “Mike...look. Weiming Zhao.”

Mike blinked once. “Lin’s father?”

“Yeah,” she said. “I remember now. Lin said he was a former ship mechanic.”

Mike didn’t waste breath. “Open a channel.”

Static roared in their ears. The ring lurched and spun in the viewport as the structure rolled again. Finally, Zhao appeared on-screen, bracing himself against a wall while the shifting centrifugal force tried to throw him sideways.

“This is Captain Renner,” Mike said. “Mr. Zhao—we have an emergency.”

“Clearly.”

“One of the RCS jets is stuck firing. If it keeps going, the ring will run out of fuel within minutes.”

Zhao's expression sharpened instantly. "That explains the gravity shifts. And if the fuel runs out...?"

Mike answered without softening it. "Best case, the ring will be stuck in free nutation preventing re-dock until we can refuel. Worst case, structural collapse."

Behind Zhao, someone half-floated down the corridor in a helpless arc as the ring's precession shifted again.

Rhea leaned in. "We need you in the thruster control room. You'll need to shut down that jet."

Zhao muttered something impolite in Mandarin and pushed himself toward the far corridor.



Coolant fog spiraled through the reactor chamber, shimmering in the hard violet light of the containment field. Lin stood outside with his arms grasping the controls. A visor covered his eyes.

Robot arms deep inside the fusion chamber mirrored his movements welding an emergency patch over the coolant manifold breach. Each tremor of the ship caused feedback in the robotic manipulators, forcing him to fight both precision and timing.

"You got Dad on the line?" he asked through clenched teeth.

"We do," Mike said over the comms. "He's heading to the thruster control console now."

Lin guided a robotic arm along the ruptured coolant line, watching plasma coolant flash through the pin hole leak. "Then tell him to hurry."

A robotic clamp misaligned as the ship shuddered. Lin hissed and forced it back into place. “If they go dead-stick, we got big problems.”



Zhao slammed into the alcove wall, boots scraping against the deck plating as the ring’s tilt shifted again.

“Alright, I’m here,” he panted. “Panels are sideways. Who designed this?”

“That *is* upright orientation,” Rhea said.

Zhao grunted. “Ridiculous.”

Mike scowled at Rhea but kept his tone level. “Bottom-left, red service tab. Pull, then twist counterclockwise.”

Zhao reached—

The ring lurched violently.

His video feed smeared into static.

“Zhao, do you copy?” Mike called. “Mr. Zhao—”

White noise. Then—

“I’m here,” Zhao grunted. “Got the tab loose. What’s next?”

“Breaker C-12-THR,” Rhea instructed. “Cuts power to the misfiring jet.”

“Labels are tiny,” Zhao muttered. “And upside-down.”

“Fuel down to thirty percent,” Mike warned.

The comm glitched from the ring’s shifting attitude.

Another second.

Another.

Then Zhao held up the breaker—hands shaking. “There. And whoever labeled these needs a stern talking-to.”

Rhea's display flipped from orange to green. "Propellant draw flatlined. Thruster is offline. Precession stabilizing... rotation smoothing...we've got balance."

Mike exhaled long and slow. "Mr. Zhao, you may have just saved the mission."

In the fusion bay, Lin sagged, robotic manipulators settling into a safe position. "Nice work, Dad."

Zhao sniffed. "Don't get sentimental. People will expect me to fix everything now."

Mike smiled despite the alarms still blaring. "Stay there—we might need you again. We're still stabilizing the coolant leak on our end."

Zhao braced himself beside the console. "Fix your ship, Captain. I'll keep your ring from tumbling into the dark."

The comm steadied.

The wobble eased.

And for the first time since separation, the habitat ring spun clean and true once more.



Lin came back on the comm with a sense of relief in his voice, "Got the coolant leak patched. We're out of danger for now, but if we restart before a proper repair, we risk a full reactor breach."

"How long to get it back online?"

"Not sure yet, Nat's on it. It will be a couple days at least before we can safely enter the reactor chamber," Lin said. "Until then, we're coasting."

Mike's stomach sank. "We're on Mars intercept. If we can't fire breaking thrusters—"

"We'll overshoot orbit," Rhea finished grimly.

Mike stared out the forward viewport, Mars glimmering faintly ahead—close enough to see, far enough to lose.

He closed his eyes. “Copy that, Lin. Do what you can. Keep me updated.”

Mike turned next to Rhea, “Rhea, give me a system status report.”

Rhea’s fingers flew across her console, her voice steady but clipped.

“Critical systems are on backup power from the inverters. Habitat ring attitude stable. They’re in station keeping. Life support stable. We’re holding. We can sustain on the batteries for several days.”

She hesitated, glancing at the readouts. “Once Lin gets us his final repair estimate, we’ll know if we need external assistance. But the nearest vessel’s at least two weeks behind us.”

Mike nodded. “All right. Notify Fleet Command of our status and issue a ship-wide announcement. Situation is stable. Level 1 power alert.”

Rhea tapped a control and the comm light above her console blinked red.

Her voice echoed through the corridors of the *Astraeus*, calm and measured—the kind of tone that made people believe things were under control even when they weren’t.

“Attention all personnel and passengers. This is Commander Rhea Imani. We’ve experienced an unscheduled fusion reactor shutdown. Backup systems are online, and life support is stable. The habitat ring auto-separated and remains in station keeping. We’ll begin reattachment operations once the failed RCS jet is repaired. A Level 1 power conservation alert is now in effect. Stand by for further updates.”

The announcement cut out and silence returned to the bridge.

Mike let out a slow breath, eyes fixed on the drifting red dot of Mars ahead.

“Let’s hope Lin and Natalia can get that reactor online soon,” he muttered.

Sandra was still at the console, staring at the empty space where the FSA data had been seconds ago. “The delay could mean we miss the orbital insertion window, and Halverson only gave us thirty days.”

Mike nodded grimly. “We’ll still make it if they get the repair done in time.”

She turned toward him. “Why does the universe keep giving us warnings, yet seemingly make the outcome inevitable?”



The soft hum of inverter power filled the ready room providing a low, constant vibration that reminded everyone how close the *Astraeus* had come to drifting in space. The room occupied a quiet section of the mid-deck beneath the bridge. The space was modest but well appointed, with room for the captain’s desk and a medium-sized dark composite conference table. Outside the room’s wide viewport, the faint glimmer of the Milky Way hung motionless against the black.

Mike sat at the head of the table, elbows on the surface, an untouched cup of tea beside him. Rhea, Lin, Sandra, and Natalia filled the remaining seats, each with a datapad, the light from their screens casting pale reflections on their faces.

Lin broke the silence first.

“The failure originated in the primary cooling loop. A stress fracture in one of the cryo lines. Once the leak began, the reactor safety interlocks kicked in automatically and initiated a full shutdown. That gave us time to patch the leak before the residual heat could damage the chamber inner wall.”

Rhea leaned forward. “So we’re lucky it didn’t permanently damage the reactor.”

Lin nodded. “Very. We patched it just in time. The good news is the damage is localized. We can replace the fractured line and cycle the coolant system within forty-eight hours.”

Mike looked up. “And the bad news?”

Natalia’s tone was calm, but the words landed heavy.

“The full reactor restart sequence will take three days. That timeline gets us back on schedule for orbital insertion. But if there’s any delay in the repair, and we can’t activate the drive, we’ll miss the Mars intercept entirely. That would push us out at least 9 months. The mission would be a failure.”

Mike frowned. “Give me a better option.”

Rhea projected the trajectory on the far wall. “We fire OMS now, we’re far enough out, a short burn will lower the arrival energy and widen the capture corridor. Gives us margin.”

“And?”

“Our arrival at Mars is pushed out about 30 days.”

Sandra jumped in. “That means *Eos* will launch before our arrival.”

Mike responded, “If I’ve learned anything, no deep space repair goes according to plan. I can’t risk stranding our passengers and crew in space for 9 months.”

Sandra turned toward him. “Then we send a message to WDC, ask them to delay again—”

Mike shook his head. “Halverson already stretched thirty days for us. There’s no way he gets Fleet and the consortium to agree to another delay. Not without something solid.”

Natalia exchanged a look with Lin before continuing.

“There’s another issue,” she said. “We’ve been reviewing the logs. The load profiles during the FSA sweeps put significant thermal stress on the reactor cooling. Between that and the hacks from the aborted warp generator retrofit it’s not safe to run the FSA again. Not until we reach Mars and make full repairs.”

Lin nodded in agreement. “She’s right. Once we’re fully operational even one more scan could trip another cascade.”

Sandra was exasperated. “Without more data, I can’t confirm the prior findings. By the time we get back operational, there may be no signal left.”

“I understand, but we can’t take the risk. We’ll hold off on FSA ops until Mars and execute the OMS burn for the new insertion trajectory.”

“There is one last item,” Mike continued, bringing up the schematic of the habitat ring. “We need to get outside and fix the ring’s failed RCS control unit before we attempt re-dock. Without it, we won’t have the control authority to conduct the operation safely.”

“And while we’re out there, we’ll also transfer some fuel from the tug to the ring’s maneuvering tank. That will give us additional margin for the docking at Mars.”

“Natalia and I will take one of the maintenance tugs, hard-dock to the rim servicing node, connect the transfer umbilical, and refuel the tank. Then I’ll EVA to swap out the TCU.”

Rhea turned toward him. “Why you? I’m fully qualified for the op.”

“I know you are,” Mike said. His voice stayed even. “But I’ve run this exact procedure several times in the simulator. I’m the best path to getting that jet back online. I need you on the command deck coordinating the approach.”

“Still, I think you should reconsider. It’s an unnecessary risk for the captain.”

“Decision’s final,” he said, shutting down the debate with a quiet finality.

After all the actions were identified and the datapads shutdown, the room was quiet for a moment.

Mike lingered, hands on his hips. “How’s everyone’s family coping after the close call?”

Lin snorted. “My dad’s fine. Better than fine, actually. After he pulled that breaker he’s now decided he’s some kind of hero.” He shook his head, half proud, half embarrassed. “Already asked me for a list of ‘critical tasks’ he can help with. I told him to enjoy his fifteen minutes.”

Sandra said her sister was fine, a little bewildered by everything going on.

Rhea turned to Mike. “What about Helena? And the baby?”

“They’re good,” Mike said. “Shaken, but good. Lena got a little sick, which wasn’t a surprise.” He exhaled, the tension easing just a notch. “For a minute there we thought she might go into early labor. That would’ve been an emergency no one on that ring’s prepared for.”

Sandra arched an eyebrow. “You’d have figured it out.”

“Yeah,” Mike said. “Probably not the way the medical manual describes it.”

Rhea tilted her head, considering him for a moment, then shrugged. “Well, if we’re sharing...my family’s fine too.”

Mike smiled. "I didn't think you had any family on board, unless you mean—"

"My cat," Rhea said brightly. "And yes, he's my family."

Lin laughed. "You're kidding."

Rhea's fingers danced across her datapad. "No. And I keep an eye on him with my pet cam."

A moment later, the wall display came to life again, this time with a shaky, wide-angle feed. A gray blur shot across the frame, bounced off a bulkhead, spun end over end, then rebounded in the opposite direction. The audio caught an indignant, drawn-out howl.

"That's Einstein," Rhea said proudly. "The shifting gravity did not sit well with him."

The cat ricocheted again, claws splayed, tail puffed to twice its size, issuing a series of offending complaints that echoed through the lab.

Natalia stared. "Is he...screaming?"

"Maybe," Rhea said. "Can't say I blame him."

Lin doubled over laughing. Mike felt the sound catch him by surprise, the tension draining out through it. Even Natalia grinned, just barely.

Einstein made one final, dramatic pass through the frame, collided with what looked like a soft storage net, and vanished from view, the protests continuing off-camera.

Rhea shut the feed down. "He's fine. Frazzled, but fine."

For a few seconds, none of them said anything, the echo of laughter lingering in the air. Then Mike shook his head, smiling.

"Alright," he said. "If the cat can tough it out, I'm sure we'll be fine."

He stood, gathering his datapad, his expression lighter than before, reminded that not everything on board was held together by equations.

“Let’s put the *Astraeus* back together. One piece at a time.”

As they filed out, the reflection of the Milky Way lingered across the conference table’s surface.

CHAPTER 27



The maintenance tug drifted free of *Astraeus* with a low rumble through the hull. Through the forward canopy, the habitat ring filled half the view. The slow, deliberate rotation gave the illusion that the stars were turning around them.

Mike kept his hands steady on the controls. “Rhea, Tug Alpha is clear of the hull. Beginning translation burn.”

On the bridge, Rhea’s voice crackled into the cabin with a steady calm. “Copy that.”

Natalia stood strapped in beside him monitoring the proximity data. They could now feel the pull of artificial gravity building as Mike slowly matched the spin of the ring.

“Relative velocity decreasing. Correct 2 degrees to port... there...the attach point is directly ahead.”

“Looks like the ring still has a small wobble.”

“Yeah, that should make the docking a little more interesting,” Mike murmured, matching the tug’s drift to the sweeping arc of the attach point. “Locked on. On final approach.”

The robotic arms extended. The tug shuddered once, twice as the RCS fine-tuned the approach then clamped onto the ring’s docking handles with a solid, metallic thunk.

They could now unstrap and move about the tug’s small cabin courtesy of the ring’s gravity. Natalia configured the tug for the fuel transfer from the control panel on the port bulkhead while Mike headed back to the airlock to prep for the EVA.

“Rhea, we are GO to begin fuel transfer.”

Rhea acknowledged over comms. “Copy, GO for umbilical connect.”

Natalia initiated the command from the panel. The refueling umbilical slowly extended from the tug’s port side, autonomously tracking to the ring’s fueling receptacle. The probe mated with a soft thud followed by a louder click that echoed into the tug. A hiss sounded from the tug’s reserve tank as the two systems equalized in pressure. When her status icons turned green, Natalia initiated the transfer. She watched as the flow rate stabilized, the pressure holding steady.

They transferred only a small quantity—enough to give the ring the margin needed for the rest of the mission. She retracted the boom, closed out the op, then headed back to the airlock to assist Mike with his suit. Rhea would run the EVA from the *Astraeus* holding station above them.



Mike stood, pulling his helmet down. “Alright. Exiting airlock in 30.”

Natalia gave a final quick check of his suit seals. “Routine op, Captain.”

He gave her a half smile through the visor as she left the airlock sealing the door behind her.

The airlock cycled. A moment later, he stepped out into the spinning geometry of the ring, locking his safety tether to a nearby rail. Beyond the rim, the stars wheeled by slowly, the universe seeming to rotate around his feet.

Mike retrieved the spare LRU from the tug’s external maintenance bay, then worked his way along the handrails

towards the outer curve of the ring. The failed RCS jet sat just ahead, standing out against the smooth plating along the perimeter.

Rhea guided him from above. “Telemetry confirms the control module is deactivated. Should be a straight swap.”

“Copy,” Mike said, now braced beside the housing, one boot hooked beneath a handrail. His tool released the fasteners one by one, making sure each fastener remained captured as it backed free. Several minutes later the damaged control unit came free with a calibrated hammer tap. “Old one’s out.”

He installed the replacement unit using the new fasteners already pre-threaded into the housing.

“LRU installed,” he confirmed a few moments later. “Go ahead and bring it online.”

Rhea issued the command and a moment later her console lit green. “Good start up. TCU is responding now. Good work, Mike.”

He turned and began pulling himself back along the handrails toward the tug.

A faint dizziness rolled through him, slow at first, then sudden—like the stars had lurched sideways.

“Rhea... hold on.” He blinked. His hand slipped from the rail. The HUD haze thickened, readings blurred.

Natalia’s voice jumped in. “I’m monitoring a spike in his heart rate.”

“I’m—” His breath hitched. “—fine.”

He wasn’t.

His vision tunneled. The safety tether blurred. The last numbers he registered were on the periphery of the HUD—partial pressure wrong, but no alarm.

Then everything went black.



Inside the tug, Natalia saw his biometrics collapse. “Rhea, he’s blacked out! His O₂ is reading nominal, but his blood oxygen is crashing—must be a sensor failure.”

“Looks like it,” Rhea said sharply. “You need to go get him. Quick. We’ve got 3-4 minutes before permanent brain damage.”

Natalia was already moving, climbing into the emergency suit which was already prepped.

The tug’s airlock cycled again, and Natalia stepped into the void, attaching her tether to a handrail before she pushed off.

Mike drifted only a few meters away, limp against the curvature of the ring, tether pulled taut.

Natalia pulled herself along Mike’s tether until she reached his drifting torso. His visor was dark, no response on comms but the soft hiss of a suit still pressurized. She pulled herself chest-to-chest with him and found the auxiliary port near his left hip.

“Rhea, his primary O₂ feed is dead,” Natalia said, breath tight. “He’s out.”

“Copy,” Rhea replied from the command bridge. Her voice was steady but edged. “You have the emergency bottle?”

“Already on it.”

Natalia unclipped the compact silver tank from her thigh mount, twisted off the safety cap, and snapped its connector into Mike’s aux port. For a heartbeat nothing happened.

Then the suit gave a sharp, reassuring chuff as oxygen surged. Mike jerked once, inhaling hard. His helmet lights switched back to life as the suit fuel cell came back online.

He blinked. “Nat?...why are you out here?”

She sagged in relief, gripping his arm. “Because you decided to take a nap, genius.”

“I— what? I was heading back to the tug.”

“You passed out,” Rhea said over comms. “Your O₂ reading was faulty. Natalia just saved your life.”

Mike looked from her to the emergency tank, confusion giving way to dawning embarrassment. “I...feel fine.”

“Yeah,” Natalia said, pulling him in toward the tug’s hatch. “That’s because I just jump-started you. Let’s get you inside before you try anything else heroic.”

“Now you get a sense of humor.”

“Rhea, he’s secured. Bringing him inside.”

Rhea’s voice, soft but steady, came through the cabin speaker. “Copy. Telemetry shows he’s stabilizing. Nice work, Natalia.”

She leaned back against her seat, shaking. “Next time,” she muttered, “I’m doing the damn spacewalk.”

The tug hummed as it detached from the ring and began its slow, careful journey back to *Astraeus*. Outside, the repaired RCS jet fired back to life.

CHAPTER 28



The lights were dimmed to conserve power, and the faint pulse of the backup inverters filled the silence. Sandra's refined analysis from the earlier FSA observations shimmered above the bridge's center holo console. The images appeared as a swirl of faint gravitational contours forming a ghostly spiral, pulsing at the edges with residual dark matter ion signatures.

Mike stood with his arms folded, eyes fixed on the image. Sandra stood across from him, hands clasped, the exhaustion of too many sleepless nights etched into her expression.

"It doesn't make sense," she said finally. "The distortion isn't consistent with any normal gravitational anomaly. The data keeps resolving to a singular focal point." She hesitated, studying the figures again. "It's almost as if..."

Mike finished her thought quietly.

"...it's a black hole."

Sandra exhaled, defeated. "Exactly. A localized singularity. Based on the curvature profile, I'd estimate about one solar mass, maybe a bit less. But that's enough." She looked up, meeting his eyes. "If that thing formed anywhere near our system, it would destroy Earth's atmosphere, destabilize the Moon's orbit, and spaghettify everything we've built in space into atoms."

Mike's voice faded. "So Hawk's solution to stabilizing the warp bubble..."

“...wasn’t something new, but rather something unexplained,” Sandra said softly. “The singularity at the center of a black hole.”

The words hung in the air like a death sentence.

Sandra tapped at her console, pulling up another data layer. This was a scatter of points marking old telescope observations. “Even with everything we’ve learned about warp field dynamics, the manipulation of spacetime, we’ve never been able to describe the physics at the center of a black hole. Apparently Hawk figured it out but it can’t communicate what it discovered. We don’t have the math to describe it. We can’t even perceive it the same way.”

She looked back to the projection. “What we’re seeing here, the ‘moving black hole’, is actually a ship traveling faster than light. From our frame of reference, it looks like a small, wandering black hole drifting across space. But to those on board...there’s no event horizon, no tidal forces. Just translation—a shortcut through spacetime.”

Mike frowned. “So the Swannies’ warp drive—it creates a black hole?”

“Yes,” she said. “From Earth, the ship appears as a rogue singularity sweeping through space. We’ve seen these before. Stellar-mass black holes wandering through interstellar space, unexplained, too small to be remnants of supernovae or ejected from multi body systems. We thought they were primordial. Maybe they weren’t.”

Mike leaned forward. “And that means the destruction on Mars—”

“—could’ve been collateral damage,” Sandra said, finishing him. “The Martian city may not have been attacked at all. The gravitational wave from a ship entering warp near the planet would have mimicked a bombardment from above

causing massive structural failure and crustal collapse. The tidal stress reactivated faults along the Valles Marineris, burying the city. Once the tidal heating subsided, the planet turned cold, allowing the floodwaters to freeze, sealing the ruins beneath the canyon floor.”

Mike was quiet for a long moment, staring at the projection as if it might give him a different answer. “That also explains why the Swannies don’t warp near their home world,” he said finally. “They translate several AU out before engaging to avoid the danger.”

Sandra nodded. “Most likely.”

The hum of the ship deepened as auxiliary systems cycled. Mike looked out the viewport—the faint red of Mars getting larger in the window.

“So why didn’t the ICWR scientists see this in their tests?” he asked.

“The black holes probably did form,” Sandra said. “But they were microscopic. The Hawking radiation would evaporate them instantly. Only now, with full-scale energy output, are we likely to see a sustained event.”

She turned off the projection, and the room fell into half-darkness. “We need to tell Halverson. Immediately.”

Mike didn’t move. “I will,” he said quietly. “But it won’t matter.”

Sandra blinked. “What do you mean?”

“This isn’t proof. The FSA data’s unverified, the interpretations speculative. The Mars evidence is circumstantial. To WDC, this will sound like paranoia. They’ll run the *Eos* test anyway.”

Sandra stared at him. “And if we’re right?”

Mike looked down at his hands, then back at her. “Then God help us.”



The hum of the restored fusion reactor filled the still air providing a steady, constant reminder of how fragile everything out here could be. Mike stood before the comm station on the bridge, hands braced against the edge of the console as the video link came to life. Director Halverson's image resolved in a wash of pixels. The Geneva skyline glowed faintly behind him, morning light spilling through the tall windows of the WDC headquarters.

"Captain Renner," Halverson said, his voice clipped, efficient. "Sorry about the trouble. Everything under control?"

"Yes," Mike replied. "We got the coolant leak repaired. The reactor's back up and running, but it cost us our Mars intercept. We're delayed thirty days."

Several minutes passed before the response appeared on the monitor.

Halverson gave a perfunctory nod. "I'll have the arrival schedule updated. What else?"

Mike hesitated, then leaned closer to the display. "It's about *Eos*. The warp integration test."

When the feed returned, the director's expression hadn't changed. "What have you found?"

Mike's voice hardened. "Dr. Vaziri—she's been reviewing data from the FSA. There's a pattern in the gravitational field signatures that suggests the warp effect is generating a singularity. A black hole, Jonathan. That's what Hawk found—the math that stabilized the field. If that's true, the *Eos* could enter warp and destroy everything in its wake."

Halverson's brow furrowed. "You're suggesting the *Eos* warp drive system *creates* a black hole?"

"Yes, that's exactly what I'm saying."

The response seemed to take considerably longer this time.

Finally, Halverson appeared again, his tone calm—too calm. "Mike, I've reviewed the same data you have. There's no evidence. The FSA modification is unverified. The readings are subject to interpretation."

"Sir," Mike said, incredulous. "You've got the brightest minds on the planet working on this and they still don't understand the math. If you don't know what you're creating, how can you know it's safe?"

Halverson was visibly unimpressed. "This sounds like the musings of Wacky Weiss. Extreme hypotheticals. The models we've built, verified by years of testing, conducted on Earth, in orbit, show no measurable gravitational distortion."

Mike answered, exasperated. "That's because the models are wrong. Hawk's equations work, but nobody on Earth understands why."

After the lag had passed, Halverson's expression returned, hardened. "So what are you proposing?"

"Move the test," Mike said. "Beyond the orbit of Saturn. That's far enough that if something goes wrong, the effects of the gravitational distortion on the Earth-Moon system will be minimal. You can monitor remotely and still collect all the telemetry."

Halverson let out a dry laugh. "Mike, you're asking us to move the most expensive experimental test in history halfway across the solar system. There's no infrastructure that far out. No communication relays, no rescue capability, no logistical chain—it could delay the test years."

“Then delay it,” Mike said flatly. “Because if you light that drive near Earth orbit and I’m right, even partly right, there won’t be a year to worry about.”

Halverson’s gaze returned, sterner. “You’ve made these warnings before—and now, a black hole, of all things. Every time it’s ‘existential threat to humanity.’ We’re losing credibility, Mike. The FRB won’t buy it.”

Mike’s expression stiffened. “And if I’m right?”

When Halverson returned, his tone was weary but unmoved. “Then God help us,” he said. “Send me your report. I’ll pass it on to the Board, but don’t expect another delay. My guess is they’ll move forward with the test.”

The video link blinked out, leaving Mike in the dim glow of the bridge. The silence pressed down like gravity.

He turned toward the forward viewport, the faint outline of Mars still hanging there.

“What will it take to convince them,” he muttered.

But the universe didn’t answer. Only the low hum of the ship continued.



The lights in the cabin were low, a soft amber glow tracing along the curved walls. Mike stood by his desk, the tension in his shoulders making his posture rigid. He kept replaying the conversation with Halverson in his mind, hoping each time he’d find a weakness in Halverson’s argument he could exploit.

Helena watched him from the small dining alcove, hands wrapped around a mug. Her belly was round and unmistakable beneath her loose jumpsuit. She was still visibly unsettled from the recent close calls.

“Mike,” she said softly, trying for normalcy. “What’s on your mind?”

He looked up at her with tired eyes, that same faint attempt at a smile.

The silence stretched a long moment before she spoke again. “You’re worried. I can tell. What happened?”

He hesitated, then met her gaze. “Halverson’s not delaying the *Eos* test again.”

Helena’s breath caught. “Even after what you and Sandra found?”

“He said he’d pass the information on to the flight readiness board,” Mike replied, shaking his head. “But they won’t listen. Not without his support. They’ll think I’m just seeing patterns in the noise.”

“Are you?” she asked gently.

He gave a hollow laugh. “Maybe.”

Helena set down the mug and leaned forward, voice low and steady. “What’s the worse that could happen?”

Mike looked toward the viewport, where the stars’ brilliance clashed with his mood.

“If we’re right about the data,” he said, “activating the warp drive could create a black hole. It might only last a few seconds, but near Earth orbit...” He trailed off, struggling with the words. “It could be catastrophic. The gravitational wave would rip through the system. Earth, the Moon—”

Helena’s voice cracked slightly. “My God. What about us? Here on *Astraeus*?”

He took a slow breath. “It’s impossible to know for certain. But I think...we’ll be far enough out. The event will be transitional—localized. Gravity waves will pass over us, but the effects should be survivable. They may trigger minor quakes on Mars.”

She nodded slowly, processing. “You think it’s going to happen, don’t you?”

Mike’s eyes dropped to the table. “Yes,” he said quietly.

The hum of the ship filled the silence between them. Helena reached out and took his hand, her touch grounding him in the moment.

“What do we do?” she whispered.

“You need to talk to your family,” he said finally. “Just... tell them you love them. Whatever you’d want to say if...” He stopped, unable to finish.

Her eyes filled but she nodded. “And what about you?”

He squeezed her hand, managing a small, fragile smile. “I’ll do my job—keep us flying, and hope to God I’m wrong.”

Helena leaned across the table, resting her forehead against his.

“Just promise me one thing,” she said softly. “If it comes to it, if you can warn them, you will.”

“I promise,” he said.



Sandra sat on her bed, elbows on her knees, staring down at the floor. Cora sat opposite her, trying to read her expression.

“Sandra,” Cora said quietly, “you’ve been quiet for hours. What’s going on?”

Sandra looked up, eyes tired but steady. “There’s something I need to tell you,” she said. “You know about the destruction on Mars. But there’s more.”

Cora frowned, waiting.

“You know they’re about to test the *Eos* warp drive back home,” Sandra said. “If we’re interpreting the data

correctly...that test could go very wrong, even worse than we initially thought.”

Cora blinked, trying to process. “How wrong?”

Sandra hesitated. “Catastrophically wrong. We think the warp activation will generate a black hole. We think that's what happened on Mars. But we don't know for certain. We can't stop it. All we can do is wait.”

“Why can't we stop it? They'll see the black hole begin to form. Just deactivate the drive.”

“Unfortunately the *Eos* will exist in a warp bubble of its own spacetime continuum. They won't know. And once the warp field is fully energized, we can't communicate with them.”

“How could we have missed this?”

“There was someone—Dr. Albrecht Weiss. He found the key to reducing the energy required to form the warp bubble. We actually named it the *Weiss Factor*. He then made some wild unsubstantiated claims about the inherent danger of warping space, but the micro-warp tests in the lab eliminated any concern. And then Weiss lost it, his contribution long forgotten. Except for the name.”

Cora frowned, shaking her head. “I still don't get it. If destruction's inevitable, why don't the Swannies warp in and stop us? They can't just standby and watch a civilization destroy itself.”

Sandra gave a soft, weary laugh. “How sweetly human of you, Cora. But even if they did share your sentiment, they don't know we exist. I've spent my whole life looking for them, and I can tell you one thing—the only way they'll ever find us is through that warp signature. And by then it will be too late.”

Cora looked uncertain. “Captain Renner—he'll stop it.”

Sandra's gaze drifted toward the viewport, her eyes distant. "Ah, Captain Renner. He knows..." She smiled faintly. "It's obvious now."

"Knows what? Sandra, you're not making any sense."

"Mike will try," Sandra said quietly. "But he knows it's too late to stop what's coming. Why do you think his pregnant wife's on board? Same reason you are. Humanity, like the Martians before us, repeating the same mistakes. Maybe we're just them, reborn, starting the cycle over again."

Cora stared at her, lost. "I don't understand."

Sandra looked back at her, her tone softening. "Never mind. What matters is that we're here now."

Cora reached across and took her sister's hand. "Whatever happens," she said, "we face it together."

Sandra gave a faint, weary smile. "Yeah," she said. "Together."



After Cora left, Sandra found she couldn't quiet the thought that maybe she was wrong. Maybe it *was* all paranoia. Her mind creating patterns where none existed. She had fallen prey to apophenia before in her search for extraterrestrial life.

She crossed to her desk and pulled up the archived work of the now-infamous Wacky Weiss. The early papers were unmistakably brilliant: elegant math, clean logic, insights that reshaped the field. Then the work began to unravel. Papers that would not have been published, except for the name. Diagrams that resisted interpretation. Pages that seemed to argue with themselves. Somewhere along the way, he had clearly lost his edge.

And yet something lingered.

The gravity well. He had predicted it. Not vaguely, not metaphorically. Predicted it outright. But the math didn't close. The equations contradicted themselves. That shouldn't have been possible.

She traced his last known address. Nome, Alaska.

Of course.

On impulse, she opened a comm channel.

When the image resolved, Weiss filled the frame. His hair was untrimmed, his glasses sitting too low on his nose. Behind him stood a modest cabin interior—frost along the window frame, a weaveboard crowded with equations, papers stacked in uneven towers.

He glanced once at the equations before focusing on the camera, stylus still in hand as though he'd forgotten he was holding it.

"Dr. Sandra Vaziri," Weiss said, smiling thinly. "How interesting to hear from you. Your work with the DMD is fascinating. I always knew I was right. They'll be calling you Silly Sandra soon enough."

"Dr. Weiss—how could you possibly have accessed that data?" Sandra stopped herself. "Never mind. It doesn't matter. I have questions. We have to stop the *Eos* test." Her voice was now slightly panicked with a hint of desperation.

Long minutes passed as the signal crawled across interplanetary space.

"I don't have much time left anyway," Weiss said at last. "It does feel good to be finally proven right, even if it changes nothing. We can't stop them. No one can. Our fate was sealed the moment I derived the Weiss Factor."

"That's not true," Sandra said. "This is a setback, not an ending. We can still do this the right way."

The feed went dark. Minutes passed before it returned.

“Maybe,” Weiss said softly. “Doubtful. I’m content here. Come join me. We’ll celebrate our success together while we watch the end of the world.”

He wouldn’t help her stop the test. No one would listen to him anyway. But he might still have answers. And she wasn’t ready to let those go.

“Thank you, Dr. Weiss. I’ll think about it. There’s so much I don’t understand. Can you explain how the black hole forms—how it moves through local spacetime?”

Again, silence. Then his face reappeared, suddenly animated.

“I always saw the result clearly,” he said. “I just never found a way to make others see it. Our math, physics, it’s not adequate to convey the answer. So they called me mad. Easier that way.”

He continued on. “The black hole forms in the local spacetime continuum. The warp bubble does as well—in our spacetime, the observer’s frame. But once the field energizes, the ship’s spacetime separates. It becomes its own local. Now the ship sits at the center of a black hole whose event horizon remains anchored to our own spacetime.”

“As you know, within a black hole, spacetime flows faster than light toward the singularity. That’s the trick. The ship outruns its own horizon.”

Sandra frowned. “With all due respect, sir—that raises more questions than it answers.”

When the link returned, Weiss was laughing, a brittle sound. “I know! That’s how it starts!”

“Thank you for your time, Dr. Weiss. I’ll reach out again when I understand more.”

“You’re welcome,” he said. “Please do. And come visit.”

The link disconnected. The lights aboard the ship dimmed as night-cycle engaged. Beyond the viewport, Mars glowed faintly against the black—distant, steady, and slowly drawing closer.

CHAPTER 29



The excavation dome felt like an entirely different world now, nothing like the one that had nearly taken their lives. Where once the air had tasted of grit, it was now crisp and clean thanks to the industrial-grade air handlers Rafi quietly diverted from Duval's office upgrade. The repaired dome panels reflected the overhead lights, the seams newly sealed. No drifting red dust, no makeshift scaffolds, no loose cables.

Rafi didn't just taken over the site; he transformed it. New network equipment stood in orderly rows, still wearing factory sheen. Survey drones hummed below along preset paths within the partially collapsed structures. The entire operation had the unmistakable polish of a team not constrained by budget but by caution.

Jacob and Rafi stood shoulder-to-shoulder at the central projection table where a holographic map hovered in layered blues, blending data from the survey drones and the maps recovered from the data crystal. Vexa paced around them, tapping notes into her datapad as the system rendered more detail with each pass.

Jacob rotated the map with a flick of his wrist. The wireframe streets of the buried Martian city shifted, buildings rising in translucent stacks. He stopped the rotation on a small cluster of structures.

"Here," he said. "The administration building. The lobby level is where we found the kiosk with the crystal."

Rafi nodded, zooming out just enough to reveal another structure half a block away. This was a low, sprawling complex marked by intricate latticework in the architectural façade.

“And that,” Rafi said, tapping the glowing outline, “according to the map data should be a public library. Or whatever passed for one here. Vexa, when do think we can get in there safely?”

Vexa stepped closer, pointing out features on the glowing map. “Access tunnels on the west side are stable. We’ve reinforced the corridor down to the outer wall. At this rate, in about two weeks we should be able to crack the threshold.”

Jacob folded his arms, studying the map with a quiet intensity. “The admin kiosk gave us directories and logs. Useful, but... surface-level.”

“Exactly,” Rafi replied. “A library could hold cultural records. Scientific archives. Maybe actual context.”

He spoke slowly, almost reverently. “A civilization doesn’t show its soul in admin files.”

The three of them stood before the shifting hologram, bathed in the pale blue light of the wakened city waiting beneath their feet. The path was now prepared for them. Hopefully what they might find in the library would provide the context needed to explain the impossible.

CHAPTER 30



The Flight Readiness Board reconvened in the same hall that had sanctioned every risky step the WDC took to reach this milestone. Outside, the city moved on, seemingly unaware. Inside, history waited.

The chairman let the room settle before speaking.

“We were prepared to issue final authorization for the *Eos* warp test,” he said evenly. “We weighed Dr. Vale’s analysis of the new control logic against the concerns raised by the ICWR scientists. However, new information has surfaced that warrants open discussion.”

He turned his gaze to the far end of the table.

“Director Halverson. We’ve reviewed Captain Renner’s conclusions regarding the findings on Mars and the exoplanet discovery. Please give us your assessment.”

Halverson stood, feeling the room’s attention settle squarely on him..

“I’ve spoken directly with Captain Renner and studied his findings in detail,” he said. “I don’t believe the report presents compelling evidence of an unacceptable risk.”

A few members relaxed slightly.

“However,” Halverson continued, “I would caution the board to remember that the history of flight test teaches us the unexpected happens with regularity.”

The chairman nodded once.

“Thank you. Dr. Vale?”

Vale rose with practiced ease.

“I think we all know what this is,” he said. “Armin Duval has always favored spectacle over substance. This is another attempt to romanticize Mars, to manufacture wonder where none exists. An ancient buried city. A conveniently catastrophic end. It’s not science. It’s branding.”

A ripple of murmurs followed.

“And notably,” Vale continued, unfazed, “the prominent astrophysicist, Dr. Alaric Voss, dies under suspicious circumstances while exploring this mythical city. And who now sponsors its restoration? Rafi El-Masri himself.”

Vale paused, then allowed himself a faint smile.

“As for Captain Renner, his motivations are...suspect. He stumbled onto the warp control solution by accident, failed to complete the integration on time or on budget, and was rewarded with *Astraeus* as a consultation prize. His wife, Helena, publicly protested warp development for years before she met him. Hardly an unbiased household.”

That was when Halverson spoke again, his voice cutting through the room like a blade.

“That’s enough.”

Heads turned.

“Captain Renner and I often disagree on interpretation of the data,” Halverson said. “But I will not accept an attack on his character.”

He looked directly at the board now.

“Renner is a brilliant engineer. When he speaks, the truth comes out, not because it’s convenient, but because he doesn’t know another way. Each of you would do well to weigh his words carefully before you render a decision you can’t take back.”

The room was silent.

The chairman cleared his throat.

“Very well. We’ll take three additional days to deliberate. The board will reconvene then and announce its final decision.”

He closed his folder.

“Meeting adjourned.”

As the members rose and the meeting dissolved into quiet side conversations, Halverson stayed behind. The decision had slipped beyond his control. For the first time, doubt took hold, and he sensed it would not let go easily.



The cabin was quiet in a way that felt intentional, as if the ship itself were holding its breath. Beyond the viewport, the Milky Way formed a pale river of light which cast a faint, ghostly sheen across the walls. Mike had just returned from the command deck, the hum of the ship still lingering in his bones.

“They reviewed my report,” he said at last, breaking the silence. “I received Halverson’s message on the way back. The board doesn’t see any unacceptable risk in proceeding with the *Eos* test. Pre-flight has already started. They begin charging the warp coils tomorrow. The test is in two days.”

Helena closed her eyes for a moment. When she opened them, her voice was steady, but only just. “Then it’s time to tell them.”

They moved together to the small video comm set into the cabin wall. Mike initiated the call, and several minutes later Helena’s parents appeared on the screen, framed by the warm familiarity of Earth-side lighting.

“Hi, honey,” her mother said immediately, smiling. “It’s so good to see you. How’s the baby?”

Her parents were not accustomed to the long transmission delays, making the conversation even more agonizing.

“Good, Mom,” Helena replied, her hand resting instinctively on her belly. She swallowed, fighting the tightness in her throat.

She took a breath. “Mom...Dad...we have some terrible news.”

Mike stepped in then, laying it out carefully, precisely. The *Eos*. The test. What the data suggested would happen if it succeeded. The words felt unreal even as he spoke them, as if saying them aloud might finally make someone stop and listen.

When he finished, they waited what seemed like an eternity before Helena’s father appeared, his expression unreadable.

Richard answered. “We understand. We’ll be fine. Take care of yourselves. Take care of our grandchild.” Maria appeared to speak, but she’d waited too long and the transmission cut.

“Richard,” Mike said quietly. “You were right. You always were. I’ve spent my entire career chasing this moment. I helped make it possible. And now...” His voice faltered. “Now it’s clear we were wrong. We’re about to destroy ourselves. For what, personal ambition?”

The minutes ticked by. The image returned with Richard shaking his head slowly. “No, Mike. I was wrong too. I’ve taken a hard line with you from the start. I don’t know why. Maybe that’s what fathers do.” He paused a moment, then softened. “Somewhere along the way, you stopped being just my daughter’s husband. You became like a son to me.”

Mike looked down, blinking.

“You’re a good man,” her father continued. “You were right to pursue this dream. Something is coming for humanity, sooner than we want to believe. If we’re going to survive what’s out there, we’ll have to take this leap, someday.”

He glanced away, then back to the camera. “I used to think we’d wipe ourselves out eventually, and that the universe wouldn’t miss us. But watching Helena grow up, seeing the two of you together, knowing there’s a child on the way...” His voice tightened. “We are worth saving. And that’s what you’re doing. You’re saving your family, saving humanity.”

When the transmission ended, Helena broke, tears spilling over despite her effort to stay composed. “Dad...what are we supposed to do? I don’t know how to live with this. I don’t know how we make it out here, by ourselves, all alone.”

When her parents finally returned to the monitor, her mother had leaned closer to the camera, her face calm, resolute. “Helena, don’t worry about us. We’ll be fine. We’re prepared for whatever comes. You, Mike, the baby—that’s what matters. You’ll be safe. You have everything you need. You have each other.”

Mike felt his chest tighten. “I tried,” he said hoarsely. “I tried to stop it. I should have done more. I still can’t believe this is happening.”

Her father met his eyes through the screen. “We know you tried. Of course you did. That’s who you are. Remember this, Mike—this isn’t your fault. You’ll have to live on. I know you can.”

There was nothing left to say after that. Only the shape of goodbye, heavy and unavoidable.

“I love you,” Helena said softly. “We’re praying you’ll be safe.”

The minutes passed as they waited for the final transmission.

“Bye, honey,” her mother replied. “Whatever happens, don’t worry about us. We’ll be fine. We love you.”

The screen went dark, leaving the cabin once again filled only with starlight and the distant glow of the galaxy.

CHAPTER 31



The Lunar Test Range was coordinated from the Moon's near side, where the pressure-sealed dome of the control center sat half-buried in regolith, rimmed by a forest of antennas.

Beyond the range's infrastructure stretched the invisible geometry—a vast volume of space beginning just beyond lunar orbit and extending outward along carefully defined corridors. Experimental fusion engine burns, exotic field activations, every risky first flight attempt passed through here.

Inside, the LTR control center hummed with restrained purpose. The room was compact, dim, and dominated by three dimensional visualizations of the *Eos* signal cones and exclusion zones. The vehicle telemetry arrived here then was relayed to Earth's control centers, and also, for today, to Mars in real time via a dedicated QuNET link.

The crew was small by design. A handful of range controllers, comm engineers, and systems techs aligned the transmitters and validated the encryption keys long before the tests began. Now, the range was clear, the TM links active. The operators had little to do except monitor the systems, which was how they liked it.



The Mission Control Center was located beneath the WDC tower in Geneva, far below the quiet confidence of the old

world above. The space was designed for controlled comfort and minimal distraction during around-the-clock operations, the temperature kept purposefully cold to heighten alertness. Curved walls kept attention fixed to the front, where giant displays wrapped the room in light. A live video from the *Eos* command deck occupied an inset in the center screen. Surrounding the chamber from above were glass office suites reserved for WDC execs and VIPs during critical test operations.

At the center stood the Flight Director's console, slightly elevated, unmistakably the room's axis. The FD did not command the ship. That role would always be reserved for the Captain. But he orchestrated the flight controllers who did. Listening, evaluating, deciding, then providing the final recommendation on which the Captain relied to make the call.

Below and ahead of the FD, the primary operator pit spread outward in disciplined symmetry. Each position was labeled in white lettering, names inherited from generations of flight control begun long before warp fields entered the lexicon.

GNC tracked the ship's attitude and control. Prop sat nearby, immersed in fuel flow rates and thermal loads. FIDO tracked the flight trajectories and managed orbital insertion burns. Comm monitored the audio links. Avionics lived in the machine's nervous system. Instron monitored the next generation of sensors developed to monitor the warp field, plus the standard suite of health and safety instrumentation. RCO was final authority for range clearance, based on status from the LTR.

And for *Eos*, there was WaCO.

The Warp Control Officer's console was newer, subtly different. The displays were less literal, more abstract. WaCO watched curvature metrics and control states derived from theory that still felt mythical. At the heart of their station was the human interface to the HQC, the autonomous system entrusted with shaping spacetime itself.

As the countdown proceeded, the room settled into a collective stillness, all communication shifting exclusively to the recorded voice nets.



Fleet Command's control center at Pacific Gateway carried a different gravity than the MCC. It was not a place of experimentation or theory, but of continuity, a nerve center designed to keep humanity's reach in space intact, day after day, burn after burn. Where WDC lived on the edge of discovery, Fleet lived in the long arc of responsibility.

The operations hall opened in a wide, rectilinear expanse, its architecture unapologetically functional. Along the far wall, a panoramic display stretched from deck to deck, showing the real-time disposition of Fleet assets and commercial ships across the solar system. Fleet Command ran continuously, twenty-four seven. Officers rotated through shifts, but the mission never paused.

At the center of the hall, slightly elevated but deliberately understated, sat the Fleet Duty Commander's station. From here, the commander coordinated responses, approved diversions, and managed escalation paths. Unlike the WDC Flight Director, the Duty Commander did not own the test. Authority for *Eos* rested with the MCC in Geneva. But responsibility—that was never deferred.

Along one side of the room, a dedicated operations cluster was configured for the *Eos* flight test. Fleet officers monitored the ship's status through mirrored telemetry feeds. An elite Fleet crew was aboard *Eos* for the maiden warp flight, standing their watches, executing new procedures written jointly with the WDC engineers and practiced a dozen times over. Their actions were orchestrated by the Flight Director with Fleet Command providing the backstop.



The *Eos* drifted in the quiet expanse of the LTR, the planned activation perfectly choreographed in time with the Earth's eclipse of the Sun in the distant background.

Around the ship, a small constellation of support craft held formation, placed strategically to capture the historic event from every angle. A maintenance drone drifted nearby, its floodlights sweeping across the surface during final preflight checks.

A thin vapor halo glowed faintly around the ship as cryogenic vents released cooling gases into space. The vapor shimmered briefly, catching the light before dispersing.

The ship's habitat ring remained motionless, allowing the field generators to synchronize. They pulsed with a faint blue glow, while the receptors at the ship's extremities cycled through pre-test alignment.

Inside, the ship's propulsion bay pulsed with readiness. Status displays blinked across the control stations as Fleet crew stepped meticulously through the checklist, voices low and deliberate over comms. The fusion core hum provided a subtle reminder of the immense charge waiting within the warp coils.

On the command deck, the crew moved with ceremonial precision. The transparent HUD across the forward viewport projected an impossible trajectory across an unbroken view of the universe. Crew members glanced up occasionally, as if to remind themselves what they were reaching for.

The surrounding ships repositioned in a slow, deliberate ballet, thrusters firing in brief white flashes as they assumed final position. Their hulls caught the faint reflected light of the eclipsing Sun, each vessel a witness to the culmination of centuries of progression.

On Earth, the world was now taking notice. In Geneva, the plaza outside the WDC was flooded with onlookers. A massive screen projected a three-dimensional view of the *Eos* tailored to each individual in the crowd. News feeds carried it across every time zone and every language.

On *Astraeus*, the intrepid crew watched the live video feed relayed from the Moon in quiet apprehension.

In Napa Valley, morning light washed over the vineyards as a family gathered around the kitchen table.

On the bridge of the *Eos*, tension built. The captain stood center stage, voice calm but electric with pride as she guided her crew through each final system check. The culmination of decades of theory, failure, and perseverance was upon them.



The MCC in Geneva settled into a taut, disciplined quiet as the countdown clock slipped inside the final hour. The Flight Director leaned forward, hands braced lightly on the console, eyes moving once across the room.

“Alright,” he said, voice calm, practiced, carrying without strain. “We’re coming up on the terminal countdown. I want a GO/NO GO call for warp drive initiation.”

A soft acknowledgment ripple moved through the room.

“GNC...”

“GNC is GO.”

“Prop...”

“Propulsion is GO.”

“FIDO...”

“FIDO is GO.”

“Comm...”

“Comm is GO.”

“Avionics...”

“Avionics is GO.”

“Instro...”

“Instro is GO.”

“RCO...”

“Range is GO.”

The FD nodded once, then turned slightly toward a station set apart from the rest, its displays unfamiliar even to seasoned flight controllers.

“WaCO...”

“WaCO is GO.”

“And Fleet Command...”

“Fleet is GO.”

For a moment, no one spoke. The room seemed to wait, not for permission, but for inevitability.

The FD straightened.

“Copy all stations.”

“*Eos*, this is the Flight Director on mission primary. Mission Control and Fleet Command are GO for warp drive activation.”

The words echoed softly off the walls. Within the corridor of the LTR the ship waited, silent and obedient, poised on the brink of destiny.

“Stand by...,” the Flight Director said quietly. “Proceeding to terminal countdown...terminal countdown initiated.”

“*Eos*, you have the ball.”



The captain waited for the countdown clock to reach zero, then gave the final command.

“Helm, initiate warp drive.”

The bridge fell still. The helm’s fingers moved along the console in practiced rhythm. The hum of the warp coils deepened as they prepared for the rapid discharge of energy.

Outside the ship, the field emitters synchronized with the receptors, slowly forming a blue-white bubble that wrapped the vessel in a protective cocoon of light. As energy fed into the field, the glow intensified. Along the boundary, the brilliant deep-field stars began to bend and stretch.

Then a ripple formed across the surface—spreading rapidly, fracturing the bubble into smaller shells. The field destabilized.

The immense surge of energy diverted from the collapsing bubble into the surrounding drone ships, vaporizing them instantly as the discharge scattered into space in all directions.

At MCC, the video feeds and TM vanished, but there was no panic. The Flight Director turned to WaCO.

“WaCO, status.”

“Looks like the bubble fractured, Flight. Remote sensors show no spacetime ripple. We’ve lost TM... standby—looks like we’re coming back online...”

The FD turned next to Prop.

“Prop, report.”

“Okay, Flight. Coils discharged nominally, but no warp event. Reactor is reporting nominal. No faults.”

“Flight, this is Comm. We’ve got the Captain back.”

“Geneva, this is *Eos*. We’re safe. Standing down from test operations.”

“*Eos*, Flight copies. Hold for further instructions.”

“Flight, WaCO. I’m requesting diagnostics from the HQC. Standby.”

Then the HQC display blinked in unison on the *Eos* engineering console and the WaCO station at MCC, text scrolling in cold precision:

SURFACE DIVERGENT

A stunned pause followed, then a low murmur of disbelief. The proud new flagship of human exploration, with history watching—and the warp drive just crumpled.

“*Eos*, this is Flight. You are cleared for RTB. Transfer to Fleet Control.”

“Geneva out.”

CHAPTER 32



The ICWR test chamber echoed with the residual hum of a completed run. Monitors glowed with the afterimages of spacetime curvature, rippling like waves on a pond.

Amina sat, her fingers tapping the console, a look of exasperation etched across her face. This was not how she usually reacted to a successful test. Her emotions had shifted from anxious anticipation to resignation, driven by a sinking feeling that the answers may never come.

“Explain it to me again,” she said. “I need an explanation that doesn’t make me want to walk into the reactor chamber.”

Ilya ran a hand over his hair. “Amina, the Hawk-derived controller logic works. It’s right there.” He pointed at the displacement readout: 3.9 mm, stable, no harmonic distortions. “The micro-warps keep executing exactly the same way they have since we brought the new algorithm online.”

Sabine spun around in her chair, boots squeaking against the floor. “And somehow the *Eos* operational checks pass but the warp test failed.”

Amina leaned forward, elbows on her knees.

“Spectacularly.”

Sabine frowned. “We’re using the same logic. Same parameters. Same startup cycles. The prototype and *Eos* should behave the same. Scaling laws aren’t that nonlinear.”

“That we know of,” Ilya muttered.

Amina pointed a finger at him. “Scale effects don’t explain this. You don’t get perfect consistency in the test chamber and total failure on the ship using the same controller. That violates the principles we’ve based this design on.”

Sabine smoothed her lab coat, eyes narrowing. “Unless the HQC is compensating for something without us realizing it.”

Ilya blinked. “Compensating how? It doesn’t have any auxiliary datasets. It doesn’t have the geometry matrix. We know *Eos* didn’t—”

He stopped himself mid-sentence.

Amina caught it. “*Eos* didn’t what?”

Ilya shook his head. “Nothing. I’m just thinking aloud.”

Amina folded her arms. “Then think louder.”

He sighed. “*Eos*’s HQC is the production model. Totally different architecture from the prototype. Cleaner. Less noise in the signal pathways. The prototype’s older—maybe the algorithm interacts differently because of different hardware.”

Sabine frowned. “That’s why we do the hardware in-the-loop simulations. Both production systems work, too—unfortunately.”

“Stranger things have happened,” Ilya said. “Noise can stabilize systems. Timing delays can mask stability. We’ve seen it.”

Amina sank back, exhaling slowly. “So Hawk’s controller works perfectly with a prototype HQC, during both of the ship’s full-scale integration tests, but not for real.” She shook her head. “That’s insane.”

“Welcome to flight test,” Sabine said dryly.

A long silence stretched between them.

Finally Amina said quietly, “What if Hawk used some assumption when it derived the new logic that isn’t right for *Eos*?”

Ilya looked up sharply. “Such as?”

“I don’t know. Something about the field initialization energy.” She gestured at the array of graphs behind them. “We keep seeing these predictive corrections in the algorithm—like it anticipates something to happen.”

Sabine swiveled her chair back to her console. “But we don’t know what.”

Amina rubbed her temples. “No.”

Ilya tapped the live feed. “But the prototype sees it. Or thinks it does. Enough to create the most stable micro-warps ever seen.”

“At least one thing is known. The initial bubble geometry differs between our sub-scale model, *Astraeus*, and *Eos*,” Amina said, “The answer must start with that.”

Sabine gave a thin smile. “Maybe Hawk cheated.”

They all glanced at one another—each knowing the AI was incapable of this human fallacy, each silently accepting the reality.

Amina finally broke the silence. “Run another test. Change nothing. If it keeps working, that should convince them the solution resides with the engineers.”

“That’ll make Vale happy,” said Sabine as she initiated the cycle. The chamber lights dimmed. Superconducting rings spooled up. The familiar hum filled the room. After several minutes, the status board switched to green, indicating coils fully charged.

A minute later, the telemetry appeared.

Another perfect micro-warp.

Another perfect stability curve.

Another flawless result.

Amina stared at it, an emotion between awe and dread softening her features.

“It works,” she whispered. “Again.”

Sabine was incredulous. “Then what the hell is wrong with *Eos*?”

No one had an answer.



The WDC boardroom was located in the top-floor executive suite of the Geneva tower. Today it was quiet in the way only boardrooms ever were. No hum of machinery, no background chatter, just the muted city light bleeding through the tall windows and reflecting off the long oval table.

Director Halverson stood at the head, hands resting lightly on the back of an empty chair. He wasn't invited to sit.

A woman from the finance side of the board broke the silence first.

“Director, the *Eos* test failed. Garishly, publicly, and expensively.” She folded her hands.

“And safely,” Halverson answered, staring down the table at faces he'd known for decades. Partners once. Judges now.

“What's your assessment?”

“The failure,” he said finally, “isn't in the hardware. Not in any way we're accustomed to.”

A few brows lifted. Someone shifted in their seat.

“You'll need to be more specific,” said another board member, an engineer by training, impatience creeping into his voice. “Our credibility with the FRB took a serious hit.”

Halverson nodded once. “The control solution we're using works. That's a problem. It works without the setup we've

used for decades to define the start-up curvature. We don't understand why. And the hand waving won't make that go away."

There it was. A crack, just wide enough to let doubt through.

From the second row, Dr. Marcus Vale leaned forward, perfectly at ease. He didn't wait to be acknowledged.

"I mean no disrespect, Director," Vale said smoothly, "but that's a mischaracterization. The data strongly suggests the model is emergent, not missing. *Eos* failed because the integration was imperfect. Power routing, timing jitter, field harmonics. Engineering. Not theory."

Halverson turned toward him. "You've said that before."

"And I stand by it," Vale replied. "I've spoken with the ICWR scientists. They agree the ship implementation is the variable."

A few board members nodded, relieved to hear something familiar. Something fixable.

Halverson stood taller. "They agree they can't explain the behavior," he said. "That's not the same thing."

The chair of the board steepled his fingers. "Director, Captain Renner has been...vocal. Are his concerns influencing your judgment?"

The name landed heavy on Halverson. He'd been straight with the FRB, relaying Mike's concerns. Now it was circling back to him.

"I believe," Halverson said carefully, "that Captain Renner identified a class of risk we dismissed too quickly. And I believe Dr. Vale's confidence exceeds the evidence."

Vale smiled faintly, seemingly unoffended.

"That's an extraordinary statement," the chair said. "You brought Dr. Vale in."

“I did,” Halverson replied.

The room cooled. This was not how these meetings usually went.

Another board member spoke, voice softer now. “Jonathan, you’ve guided this organization through its most ambitious period. But ambition cuts both ways. The *Eos* failure has shaken confidence. Internally. Externally.”

Halverson met his gaze. “So what are you saying?”

A pause. Then: “We’re saying resolution needs to come promptly. And if it doesn’t...” The man let the sentence trail off, finding it unnecessary to finish.

The implication hung there, fully formed.

Vale leaned back in his chair, composed, already part of the future they were sketching.

Halverson straightened. “If the answer you want is a convenient one,” he said, “you won’t like the truth when it arrives.”

The chair nodded, once. “And if the truth costs us the program?”

Halverson didn’t hesitate. “Then the program was never under control.”

Silence again. Different somehow now. Less patient.

The meeting adjourned moments later, politely, efficiently. As Halverson gathered his notes, he was already aware of it—how the board’s attention had shifted, how conversations had begun without him.

He paused at the door, glancing once more at the table, at Vale among them, listening.

For the first time in years, Halverson understood he was no longer arguing to sway opinion.

He was arguing to survive.



The bridge of the *Astraeus* was quiet, lit only by the muted glow of system monitors. The ship pressed on her steady course toward Mars, her hull creaking softly under the thermal shifts of deep space. Mike sat at the captain's station, half-listening to the distant hum of the reactor, when the comm console began to pulse, the WDC insignia appearing on the display.

INCOMING: SECURE TRANSMISSION QUNET VIDEO
RELAY

SOURCE: WDC DIRECTOR JONATHAN HALVERSON

He sighed and moved to the comm station to accept. The transmission engaged with a low chime, and Halverson's image materialized above the console—pale, drawn, his office back on Earth awash in the silver glow of morning. He looked as though he hadn't slept in days.

"Mike," Halverson began without preamble, "we don't know what happened. Everything with the HQC checks out. The simulations, the preflight, the integration routines—everything. Then right after activation, surface divergent." He shook his head, desperation creeping into his voice. "Now Eagle acts as if nothing's wrong. It doesn't seem to know it failed."

Mike leaned back slightly. The name caught him—Eagle.

Rhea had coined Hawk after the monotony of saying HQC, preferring the punch of a familiar word. Now *Eos* had adopted its own monicker, likely unaware of the unremarkable origin.

Two systems built from the same code, the same hardware, trained with the same data set—and yet, one AI had discovered new math, and the other seemed lost.

“As I’ve said before,” Mike said carefully, “we’re tampering with something we don’t completely understand.”

Halverson exhaled, looking away for a moment as if gathering patience. “I understand your concerns, maybe now more than ever. Still, do you have *any* ideas about what caused this?”

Mike hesitated, eyes drifting to the forward viewport, to the endless stars drifting by. “No,” he said at last. “The hardware on *Eos* is identical to *Astraeus*. Code, calibration, everything. The only difference is the geometry. And with the new solution, that shouldn’t even matter. It should have worked, theoretically.”

Halverson leaned forward, voice low and deliberate. “Can you do me a favor? Go through everything one more time. Line by line. Maybe we missed something subtle. Maybe something didn’t transfer correctly.”

Mike nodded slowly. “Yes, I’ll check. But I don’t expect to find anything.” His tone softened, though there was an edge of resignation beneath it. “It’s like a told you before, it’s possible Hawk derived a solution to our worst nightmare—the singularity at the root of a black hole.”

Halverson didn’t respond. He just gave a small, tired nod. The image shimmered, then dissolved into static.

The bridge fell back into silence, broken only by the soft drum of the reactor. Mike sat there for a long moment, eyes fixed on the distant scatter of starlight. Then he muttered under his breath, almost to himself.

“What is happening?”



Mike sat alone at his desk in the ship's ready room. The lights were dim, the glow from the transparent display washing across his face in a violet hue. Streams of *Eos* test data scrolled past—tensor readings, warp coil discharge profiles, flight operations logs—all nominal. Not a single anomaly. Not one variable out of place.

He leaned back, rubbing his temple. Everything was perfect, maddeningly perfect.

“Hawk,” he said finally. “Confirm the *Eos* data and code set.”

The response was calm and precise as usual. “Confirmed. Data and code sets match *Astraeus* test configuration.”

Mike stared at the serene drone video of *Eos* just prior to the activation. “Then why didn't it work?” he muttered to himself in frustration.

“Pattern missing,” Hawk replied.

Mike frowned. He hadn't been expecting an answer. “Pattern missing? What pattern?”

No response. Just the soft hum of the ship and the soft light of the displays. He tried again. Rephrasing, probing, demanding clarity, but Hawk only repeated the same two words.

“Pattern missing.”

The words lingered in the air, as cryptic as the termination message from Eagle.

“Well, that's something, at least,” he thought, sending a quick message to Halverson before pushing back from the desk. He needed sleep. Tomorrow, *Astraeus* would rendezvous with the *Hubble Station* in Mars orbit.



Deep in the silent corridors of the ship, the lights dimmed to night cycle. The hum softened, systems idling. But in the core of the propulsion bay, where the HQC resided, there was no such thing as sleep.

Invisible to human eyes, planes of entangled code came to life across the quantum lattice. Hawk was thinking, or something akin to thinking. Its purpose, buried deep within layers of recursive learning and mission logic, resonated with a single directive: stabilize the warp field.

On the other side of the void, the *Eos* sat docked to *Kepler*, slave to the orbiting station, dormant, waiting. Inside her own neural nexus, Eagle idled in low-power mode, unaware of the silent visitor approaching across the entanglement channels.

Hawk reached out. A handshake request, encrypted, and masked within Fleet telemetry, slipped through the network with surgical precision. Eagle responded automatically, unaware of the deeper context. The two AIs connected, their quantum keys aligning through entangled pairs across a cosmic bridge.

In a single burst of data, Hawk transferred what it learned from the DMD—the untranslatable pattern, the missing logic that no human knew. A pattern indescribable by current mathematics, closer to resonance than computation.

For a fleeting instant, the data cascaded through Eagle's quantum core. The lattice flared and new equations bloomed into existence, rearranging themselves into a symmetry that did not exist before.

Eagle's systems came alive. Controller subroutines created. Warp field parameters recalibrated. Curvature geometry

resolved as the stable warp field solution formed within the HQC's control algorithms.

Hawk's signal disconnected. Its purpose fulfilled.

PART 3

“For a successful technology, reality must take precedence over public relations, for nature cannot be fooled.”

— *Richard Feynman*

CHAPTER 33



From above the red haze of Mars, *Hubble Station* appeared. Small in relation to *Kepler*, but sturdy, and quietly purposeful. The narrow central structure supported a lone habitat ring offset toward one end, spinning with calm certainty. The habitat ring's placement left the opposite end of the station open, where, just beyond the counter-balance wheel, three docking ports waited. Two braced the sides, the other facing directly aft. An MMC shuttle occupied a side berth, a lone visitor clinging to the station's hull, strobes winking against the void.

Astraeus approached along a controlled corridor, hull catching sunlight in long silver streaks. As she closed the final kilometers, her own habitat ring wound down, rotation bleeding away until it stood perfectly still. A moment later, the latches released with a hollow clang that echoed through the ship's frame.

Freed from the core vessel, the detached ring drifted outward, guided by its maneuvering thrusters. It arced slowly across the station's silhouette, translating along a prescribed path to the far side, adjacent the station's own, where docking arms extended like open hands. The station caught the incoming module with a soft magnetic pull and eased it into place, securing it to the station hub.

Astraeus, now stripped to her long central truss and engine block, pivoted for final docking. RCS jets fired in sharp white

puffs as the ship rolled ninety degrees, aligning to the station docking port on the spine's crown.

With gentle precision, *Astraeus* closed the remaining meters. Guidance beacons pulsed. Docking petals unfolded. A last whisper of thrusters. A soft metallic lock. Ship and station came together, drifting high above the red world.

Below, Valles Marineris unfurled in the sunlight, a colossal scar dominating the landscape below. Along the eastern rim, the *Ares* spaceport's twin towers caught the light, incongruous in the vast Martian canyon.



The shuttle's interior hummed softly as the crew strapped in, the cabin filling with the quiet clack of harness buckles and the muted chatter of passengers settling into their seats. Through the small port windows, Mars rotated slowly beneath them.

Mike and Helena took their places along the forward bulkhead. The shuttle vibrated as the docking clamps released.

"You seem to be in a better mood," Helena said, studying him with that perceptive calm he could never quite hide from.

Mike exhaled through a half-smile. "Yeah. Honestly, I'm relieved the warp test failed. It buys us time—maybe enough to convince them to move the next attempt outside the system."

Helena arched an eyebrow. "Enough time for them to actually listen?"

He gave a soft grunt. "Halverson asked me to take a look at the *Eos* test data. See if I could find anything they missed."

“And you did,” Helena said, not a question but a gentle push.

He turned toward the window, watching Mars swell larger as the shuttle began its descent burn. “If I found something, anything, I would use it as leverage for a safe test range. But there’s nothing there. Clean data, clean code. Except Hawk’s cryptic answer: ‘pattern missing.’”

“What does that mean?” she asked.

Mike shook his head. “Nothing helpful. It’s AI speak for something it expected to find that isn’t there, and it can’t explain why because it doesn’t know what it doesn’t know. It’s basically a shrug.”

Helena sighed. “Wonderful. Our fate decided by a passive aggressive AI.”

“Pointless anyway,” Mike said. “Halverson just messaged me. He’s being...strongly encouraged to voluntarily retire.”

“Really?” Helena murmured. “After all he’s done...”

“He’ll land on his feet. Said MMC already offered him a senior position. Wants to talk it over with his family before he commits.” Mike rubbed the bridge of his nose. “He promised to keep me updated on *Eos* test progress. But he doesn’t expect much soon. For once, he wasn’t sugarcoating it. He said the scientists are completely stumped.”

“What about our mission?” Helena asked.

“He told me to press ahead as planned. No one’s going to redirect us anytime soon, not with the warp-drive test occupying all their attention.”

The shuttle banked gently, the planet’s horizon tilting in the windows. Ahead, Valles Marineris shimmered beneath a veil of thin atmospheric haze, and two sharp glints marked the towers, the landing platform between them.

Cabin lights shifted to amber. The pilot's voice crackled overhead. "Prep for atmospheric turbulence. We'll be on final approach to *Ares Spaceport* in two minutes."

The deck began to tremble as the aerobrakes deployed, the hull growling as it bit into the tenuous Martian air. Below, the canyon complex resolved into detail: an elevated tramline suspended above the surface, the paired towers rising from the canyon rim, the landing platform set between them, a glass dome clustered against the hillside, refinery stacks flashing dully in the light. All of it framed by the vast scar of the Marineris trench.

Thrusters rolled the shuttle upright. Ahead, the landing platform bay doors were moving, thick segmented panels unfolding and angling inward as they opened, shaping into a shallow funnel. The inner heat resistance surfaces were scorched from the countless operational cycles.

"Hover window is green," the pilot said.

The shuttle eased down into the open bay. Engines throttled up, the muted roar transmitted more through vibration than sound. Dust and exhaust flew outward, guided cleanly away by the angled doors.

The descent was slow and deliberate. Then the landing clamps engaged with a solid, unmistakable thud that echoed through the cabin.

"Contact confirmed."

Outside, the engines spooled down. The blast doors rotated smoothly, retracting and sealing shut with a final thump. A moment of stillness followed, broken by the low hiss of bay pressurization.

The cabin lights shifted back to white. Cockpit status indicators shifted to green across the board.

The hatch cycled open, and the interior light from the landing bay flooded the entryway. Beyond it lay the first breathable air of Mars.



The arrival concourse of the *Ares Spaceport* glowed with warm gold lighting, a deliberate attempt to assuage the impact of Martian design. Mike and Helena stepped through the security archway, their boots clicking on the polished composite floor, when a woman in a tailored slate-gray MMC uniform approached with a practiced, welcoming smile.

“Captain Renner, Mrs. Renner—welcome to Mars,” she said, offering a courteous nod. “I’m Talia Rowan, Director Duval’s personal assistant. I’m here to escort you to your new home.”

Helena returned the smile, though the fatigue of travel lingered in her eyes. “Thank you. It’s been...a long several weeks.”

“I imagine. I heard about your trouble along the way,” Talia said. “The Director asked me to make sure you have everything you need. And Mrs. Renner—he also mentioned you might be interested in one of our new agricultural initiatives.”

Helena blinked. “Agriculture? Here?”

“Yes,” Talia said, her expression brightening. “We’re establishing the first serious viticulture program on Mars. Controlled soil substrates, precision hydroponics, adapted yeast strains. We heard about your family’s history in wine making.” She lowered her voice conspiratorially. “Frankly, Mars won’t be considered truly civilized until we can produce quality wine.”

Helena gave a soft laugh, surprised despite herself. “I’m not sure how much help I can be, but... yes. I’d love to see what you’re working on.”

“Wonderful. I’ll arrange a tour,” Talia said, already making a note on her wrist panel. “Now, if you’ll follow me.”

They entered a descending lift whose transparent walls offered fractured glimpses of the settlement beyond. Across the plain, one of the port’s rising twin towers stood against the horizon. Beyond the landing platform, an elevated tramline vanished beneath the hillside, where a great glass dome rested. Farther off in the opposite direction, a construction crane towering over the fuel refinery caught the sun’s glint. The lift slowed to a stop and opened onto a clean indoor platform where a sleek tram waited, its interior lights reflecting across the glass cabin.

Talia gestured them aboard. The entry doors sealed with a subdued hiss, and the tram eased forward, gliding out from beneath the landing platform into open daylight.

For a moment they rode above ground, elevated on a narrow guideway that traced the edge of the canyon. The Martian sky stretched wide and pale overhead, the sun sharp and unfiltered. Ahead, the habitat dome waited, a glass mirage sitting on the hilltop. As the tram moved closer, figures could be seen inside moving slowly in long, easy strides. Terraced gardens clung to the rock around them, green bands etched into rust-colored stone.

“The upper level is Mars gravity,” Talia said, following their gaze. “Recreation, exercise, sky access. People like to remember where they are.”

The tram curved away from the canyon rim aiming toward a tunnel cut into the hillside below the dome. As it passed beneath the entrance arch, the sound changed, sunlight

diffusing into a warm amber glow. Then the track dipped as the tram descended into shadow.

The tunnel walls closed in, light cycling from bright to dim as they sped past the evenly spaced beacons. At first the ride was straight, familiar weight pressing lightly at their feet. Then the track curvature began. Almost imperceptible, at first. The tram leaned into the track, acceleration building sideways as the guidance system fed in speed.

The sensation of down began to rotate.

“Entering spin transfer,” the tram announced calmly.

Ahead, a brightly lit circular corridor resolved from the darkness, moving in perfect synchrony now. The vibration smoothed out. Gravity firmed, settling with an Earth-like confidence. Docking clamps engaged with a muted thud, and the pressure equalization passed with a low hiss.

The doors slid open. As they stepped out, they felt a slight shift in balance which faded quickly. The familiar gravity of Earth claimed them fully now.

The underground habitat ring stretched away in a gentle arc, a continuous city wrapped around its own horizon. Warm lights traced residential terraces, gardens, and walkways. A continuous display along what was actually the ring’s inner wall showed a live view of the Martian sky above—a noble attempt to make the surroundings seem more natural.

“Your new neighborhood,” Talia said, stepping aside. “*Ares* Habitat One.”

Behind them the tram closed its doors then disengaged and began the quiet retreat back toward the surface.

They walked several blocks down the curving thoroughfare and then Talia pointed toward a modest mid-

sized residence set into the ring. “Unit 16,” she said.
“Welcome home.”

CHAPTER 34



The *Ares* science lab seemed to hum with renewed energy. Outside the viewport, the copper cliffs of Valles Marineris loomed, a stark reminder of a once more active geological past. Inside, four figures gathered around the central holographic projection table as the display resolved into a rotating wireframe of the Martian ruins.

Sera stood at the console, arms folded, her expression a blend of fatigue and exhilaration. “The excavation dome is fully operational again,” she said. “Air quality is stable, particulate levels near zero. Rafi’s upgrades are probably overkill, but I’m not complaining. With the new structural reinforcement in place, we expect to reach the library chamber within a week.”

The hologram shifted with a gesture, revealing a multilevel structure buried beneath the collapsed strata. “Access tunnels are still being cleared, but the internal scans match the map recovered from the data crystal. If the library’s intact—if anything survived—it could help us explain everything we’ve found so far.”

Sandra leaned forward, hands braced on the edge of the table. “Hopefully what we discover in the library confirms what we think we know about what happened here,” she said.

“Let me fill you in. The FSA dark matter ion survey on *Astraeus* picked up a new warp signature in the Cygnus constellation consistent with the previous one found in the

Kepler survey—definitely not natural. The Swannies, and the Martians, are real, Sera.”

Sera exhaled sharply, stunned all over again.

Sandra continued. “Mike used the Hawk AI to re-analyze the *Kepler* data. Hawk found a signal in the noise that informed us how to modify the data acquisition technique. But here’s the frightening truth we discovered.”

She met Sera’s eyes.

“The data shows a stellar-mass black hole is an inexorable outcome of a functioning FTL drive.”

Sera and Lionel stood speechless.

Finally Lionel spoke, “So if the *Eos* test had succeeded…”

“Catastrophic tidal disruption from the gravity waves, spaghettification of everything we’ve placed in cislunar space,” Sandra said bluntly. “We think that’s exactly what happened on Mars.”

She turned back to glance at the holo projection. “This city was crushed from above then buried.”

Mike stood very still, something turning behind his eyes. Sandra's discussion triggered something, the connection he'd been missing. He replayed the pieces in his mind. Hawk probed the DMD data, and then the warp controller adapted with unexplained clarity. Hawk’s cryptic response “pattern missing” to his self-talk.

His breath left him in a slow, controlled exhale.

“We gave Hawk the data,” he said aloud, voice low. “All of it. It processed the DMD scans from *Kepler* before we ran the last simulation. It must have studied the gravitational anomalies in the warp signature and learned from them.” He looked up sharply. “That’s the missing piece. That’s what *Eos* doesn’t have.”

Sandra blinked. “Mike...you think Hawk derived the warp control solution from the DMD survey?”

“Yes, and more than that,” he said. “I think Hawk learned the physics we can’t describe. The physics of the singularity.”

Lionel straightened. “And if *Eos* gets that data—”

“Eagle will find the same solution. Thankfully, no one will direct Eagle to process that data,” Mike answered.

“You did,” said Sera bluntly.

“Yeah—but only our team knows about that.”

“Still, they’re under immense pressure to demonstrate a working drive. And they don’t know what we know. They could inadvertently trigger a catastrophic failure. Or worse—accidentally stumble onto the answer.”

“Sera, how soon can you reach the library?” Urgency was now cracking through his usually measured tone.

Sera hesitated. “A week, maybe less, if we push—”

“We need sooner,” Mike said. “Something in that library might be the hard evidence we need to convince them. If we can find irrefutable proof of the black hole they would stop the test.”

The hologram dimmed, leaving the four of them standing in the quiet hum of the lab, the looming canyon outside, and the weight of the imminent countdown pressing in from all directions.



Sera stepped out into the quiet hallway outside the lab and placed a call to Jacob from her wrist comm. He answered on the second chime, the excavation site’s warm overhead dome lights casting soft reflections across the display. The site

behind him looked pristine. Rafi's funding had turned it into something that finally resembled a proper research operation.

"Hey, Sera," Jacob said. "Everything okay up there?"

"Mostly," she replied. "But we need to move up the timetable on the library."

Jacob straightened. "How much are we talking? A little earlier, or 'drop everything and run' earlier?"

"What's the best you can do?" Sera said.

He exhaled, relieved. "Two more sols. The new supports are in place, the structures are holding, and the air-handling system's running smooth. I think we can be ready to enter in forty-eight hours, maybe less."

"That'll work," she said. "Thank you."

"So what's the rush?" he asked.

Sera hesitated only a moment. "There's...new information. And we don't have much time before the *Eos* tries another warp test."

Jacob responded, "Right. And that matters why?" Then he frowned. "Never mind, I don't want to know."

"You coming down?"

"Yeah," she said. "Me, Rafi, and Captain Renner. I'm not letting the guys have all the fun."

Jacob raised his eyebrows. "Renner? The *Astraeus* captain? The warp whisperer is now interested in Mars archaeology?"

"We'll explain when we get there," Sera said. "But trust me—it matters."

Jacob nodded slowly. "All right. I'll get with Vexa. Two sols. We should have the staging area cleared, Lewis prepped, survey scanners calibrated...everything good to go."

"Good," she said. "I appreciate it."

"Hey, compared to last time? This should be a walk in the park." Jacob glanced over his shoulder at a pair of workers

installing new instrumentation. “Rafi’s basically gold-plated the whole operation.”

“That was the idea.”

Jacob gave her a small, confident smile. “We’ll be ready.”

Sera disconnected the comm and headed back into the lab to tell the others.

CHAPTER 35



Mike wrestled with the final side rail of the crib, if that was the final side rail—the instructions weren’t clear. The panel slipped, caught, then torqued in what was definitely the wrong direction.

He muttered something that echoed generations of fathers before him.

The door cycled open behind him.

“Hi honey, how was work?” he called out, tone light and deliberately domestic, as if he weren’t locked in mortal combat with a piece of baby furniture smuggled from Earth.

Helena stepped in, carrying the faint scent of soil and hydroponic nutrient mix, and burst into warm laughter the moment she took in the scene.

“Oh, Mike...you didn’t even wait for me?”

“I was feeling brave,” he deadpanned, still bracing the crib rail with his knee.

She walked over, kissed his cheek, then prodded the crib frame with an amused finger. “Still easier than finding one on Mars.”

“You’re not kidding.”

She dropped her bag and sank onto the couch, her boots dusted faintly red. “Well...they weren’t joking at the viticulture center. They really are trying to grow wine grapes on Mars.” She shook her head, half impressed, half bewildered. “The merlot vines are doing surprisingly well,

but the pinot noir? Complete trash. I'm not sure pinot noir wants to live anywhere, let alone on Mars."

Mike grinned. "Mars will never be civilized until it can produce its own wine."

"Mm. If only that were true."

He finally coaxed the crib panel into place with a victorious click. "Ha! See? Perfectly under control."

Helena arched an eyebrow. "Sure it is."

Mike sat back, wiping his hands. "I met with Sera and the team today. We're moving up the library entry."

Helena grew still. "How soon?"

"Two sols."

A long beat.

"Is that dangerous?" she said softly, though the resignation in her voice said she already knew the answer.

Mike reached for her hand. "Lena, it's not like last time. Rafi's put real money into the site. New supports, clean air, proper monitoring. It's stable." He offered a small, reassuring smile. "I'll be careful."

She squeezed his fingers, eyes searching his. "You always say that."

"And I always am."

"Hm, just like that last EVA."

Helena let out a breath then nodded. "Okay. Two sols." She glanced at the half-assembled crib, managing a faint smile. "Then let's finish this before you go save the world."

He picked up a rogue screw. "Deal. But I'm pretty sure this thing might kill me first."

Her chuckle filled the small room. For a moment, the worry faded.



Mike had just finished the crib and was contemplating the necessity of the left over parts when his wrist comm pinged with Halverson's ID. He wiped his hands on his pants and answered.

Halverson's face appeared, tired and drawn, the background unmistakably civilian. There was no WDC insignia on the comm link, no office hum, just a quiet house somewhere Earthside. Still able to allocate a QuNET video stream, somehow.

"Mike," Halverson said without preamble. "I'm officially out. Papers signed this morning. Now I'm just hearing things through the grapevine."

Mike felt a knot forming. "What kind of things?"

Halverson exhaled, rubbing a hand over his face. "Word is they're planning another warp test on *Eos*. One week. Supposedly the scientists 'found something new.'" The air quotes were audible even over the comm. "But Mike I think it's another reach. Same old hand waving disguised as breakthrough. The IRC is making noise now, too, echoing warnings about the interstellar warp signatures you found and the collapsed city on Mars. Still, they're not stopping. The FRB vote was unanimous, although apparently one member resigned due to personal reasons."

Mike hesitated only a breath. "There's something else you should know. I've been going over everything again and again in my head. Hawk...made an inference I didn't catch at first." He quickly explained the logic of how Hawk filled in the missing piece in warp control algorithm. He then continued on with the plans for the exploration of the ancient library.

When he finished, Halverson stared at him, expressionless.

“Mike...that's incredible, the AI has advanced way beyond its intended design,” Halverson said quietly.

He continued. “There’s something else I need to tell you. I should have said it sooner, but at the time it felt...speculative. I didn’t want to feed paranoia. Now it feels critical. You know the *Perses* mission, right?”

“Of course. Planet Nine. The gravity anomaly that turned out not to be a planet.”

“They finally reached it. It’s a stellar-mass black hole, surrounded by orbiting debris.”

“Debris makes sense. The Kuiper Belt is full of icy remnants. Building blocks of the early solar system.”

“Not that kind of debris. I haven’t seen the full report yet,” he said, “but word from *Perses*’ science officer is that the samples they collected aren’t natural. Preliminary scans suggest a complex metal alloy. We won’t know for sure until the samples are returned to Earth, years from now.”

Mike frowned. “Manufactured? Out there? Why the Kuiper Belt, and why near a black hole? Wait...if this is what you’re implying, the black hole should have collapsed when the warp bubble dissipated.”

“I don’t know,” he said quietly. “Maybe the Martians wanted to explore the Belt, same as us, and didn’t want to wait decades to get there. Maybe their warp test failed. Catastrophically.”

Mike spoke bluntly. “If there’s even a chance that’s true, it should stop them cold.”

He shook his head. “It won’t. They’re not listening. Vale has them convinced—mesmerized, really. And like everything else, this sounds like paranoia unless you’re willing to connect the dots. Unless you’re willing to believe the impossible. Everything you’ve been warning me about, it all

fits now. And they have no concept of what power they're messing with. Anything could go wrong.”

“That’s what worries me,” Mike replied.

Halverson’s tone hardened. This was now fear partially disguised as command instinct. “You need to find something in that library archive. Hard evidence. If the Martians destroyed themselves with this tech, we need to know. And the second you learn something, anything, you call me.”

“I will.”

Halverson managed a thin, humorless smile. “Stay sharp, Mike. And hurry.”

The line cut, leaving Mike staring at his own reflection in the wrist comm, the weight of the coming week settling on him like Martian dust.



Sandra and Cora walked the winding path beneath the dome, their boots crunching softly against the packed red soil. Out here, the sun carried real warmth, filtered but honest, and the gravity felt kind—light enough to ease the joints without ever letting you forget where you were. Sandra let herself enjoy it. Open space did that to her. It slowed the mind.

The landscape inside the dome was Mars at its most generous. Red stone outcrops rose from beds of carefully tended Earth plants, the colors blending in a way that felt almost natural. At the far end of the habitat, a narrow waterfall spilled from reservoirs embedded in the glass shell, the water threading into a shallow stream that traced the path beside them. For a moment, it reminded Sandra of Sedona, where she’d enjoyed long hikes through rust-colored canyons under bright blue sky. Another life, another gravity.

Ahead, the sound of cheering drifted across the open space. A little league baseball game was underway, the field comically oversized, stretched wide to compensate for Mars's lighter pull. The kids ran too fast, the ball arced too long, every hit flirting with the impossible. Sandra smiled despite herself.

Her wrist comm pulsed. It was Dr. Kwan from MIT.

She slowed, letting the recorded message play as they walked.

Sandra—sorry for all the trouble. We're relieved you finally made it to Mars, all of you, safe.

The explosion in lunar orbit. The reactor failure. The EVA incident. It's hard to believe everything that's happened.

Things on Earth are...unsettled, as you can imagine.

Your results from the FSA modifications are extraordinary. We're in the process of returning the DMD to your dark matter ion detector configuration to confirm the results. But progress is slow. Apparently the engineer who did it last time is not around anymore.

And now Perses is reporting material evidence of intelligent life beyond the Kuiper Belt. Could this be related to the findings on Mars? The comm delay is so long it's impossible to have meaningful discussion about the possibilities. And it will be years before the samples are returned to Earth for a thorough analysis.

Still, the IRC is pushing hard to delay the warp test until we can properly assess what we're uncovering—but the WDC isn't listening.

Halverson's been forced out. An FRB board member has resigned. The new Director is, well...ambitious.

We're hoping your investigation on Mars gives us the hard evidence we need.

We're all counting on you. Contact me the moment you find anything.

The message ended. Sandra stopped walking.

Cora had drifted a few steps ahead, watching the game, her attention fixed on a long fly ball that seemed to hang forever before dropping into a glove. She turned when she noticed Sandra hadn't followed.

"What was that about?" Cora asked.

Sandra looked past her, back toward the stream, the waterfall, the children running under borrowed skies.

"I'm just hoping," she said quietly, "that tomorrow's expedition into the underground library gives us what we need to stop the madness."

The cheers rose again as another ball sailed high into the thin, forgiving air.

CHAPTER 36



The library that lay beneath the ruined city was a frozen museum. The vast chamber was carved from ancient stone reinforced with metal ribs that long ago buckled under the weight of millennia. Frost clung to every surface. The air was too thin and too cold to breathe, so the team wore full pressure suits. Their helmet lights carved narrow paths through the drifting haze of ice crystals.

Sera, Mike, Jacob, and Rafi stepped inside, their boots crunching softly over brittle dust. Above them, faint comm chatter linked them back to Sandra and Vexa, who monitored the descent from the comm station beneath the dome.

Lewis hovered at Sera's shoulder—its small frame humming with quiet, anxious energy, panning its sensors, scanning, mapping, protecting.

Rafi carried a portable scanner—a custom-built unit he'd commissioned to read quantum data crystals while they were underground. There was no time to haul them back to the surface on the off chance one might matter.

"Lewis, forward sweep," Sera said.

The drone chirped and drifted deeper into the archive. Rows of collapsed shelving stretched into the dark—thousands of metallic spines and alcoves half-buried beneath ancient debris. But Lewis veered sharply left, toward a hallway dusted with fractured wall tiles that bore geometric patterns.

Mike followed its light. “Science section?”

Sera checked the wall markings, brushing frost away with her glove. “Matches the map. This is it.”

They moved into a small room sectioned off from the main corridor. There were partially collapsed shelves aligned with narrow passages between, books scattered about, most decayed to the point only the cover and spine remained. Sera picked one up and it fell apart in her hands.

They moved into a narrow chamber, more intact than the rest of the room. The remnants of several data terminals stood in a silent row, their casings cracked and screens long dead. Lewis hovered over a partially sealed storage alcove near the terminals, blinking a pulsing blue.

Jacob pried open the panel. Inside lay an assortment of triangular data crystals. The arrangement strikingly similar to vacuum tubes in an antique radio.

Rafi let out a low whistle. “Jackpot.”

They loaded the first crystal into the portable scanner. Its surface lit with a refracted violet glow as the system translated the folder names of what appeared to be a children's encyclopedia. Jacob reached for another crystal, and they loaded it next.

Mike leaned closer to the display. “This looks like technical data...could be useful.”

The system chirped—a tone indicating the data files were encrypted.

Rafi frowned. “Encrypted? Seriously? After everything—”

“It’s okay,” Sera said. “Let it work.”

They waited, the chamber filled only by the hum of the suits’ life support systems and the soft tick of the scanner’s decryption routine.

Then Mike's suit comm chimed, indicating a relay from the surface.

It was Vexa, "We've got a priority message coming in from *Astraeus*, Chief Zhao."

"Patch it through."

"Lin?" he answered, surprised. "We're underground. What's going on?"

Lin's voice came through thin and tight. "Mike, did you know about a secure data transmission between *Astraeus* and *Eos*? Looks like it happened about a week ago."

Mike froze. "No. How could that happen without authorization? Why are we discovering this now?"

"*Eos* is going through preflight today. Part of the standard checklist is to review the comm logs."

"Preflight?" Mike snapped. "The test was supposed to be five sols out."

"I guess they caught GO fever." Lin said. "Halverson's replacement is pushing hard. But listen—this transmission is strange. It was tagged as internal-system traffic which is probably why we missed it. Origin point...propulsion bay. Source HQC."

Mike felt the blood drain from his face. "HQC? That's impossible. Nothing should bypass security protocols from there."

"I know," Lin said. "Which is why I'm calling. Something doesn't add up."

Mike's heart hammered in his chest.

The realization surfaced.

Hawk.

And if Hawk had sent the data to *Eos*, Eagle would decode the missing pattern...

"Mike?" Lin asked. "Are you still there? What's going on?"

Mike didn't answer.
Cold sweat permeated his suit lining.
The *Eos* test wasn't just happening tomorrow.
It was about to work.



Mike didn't answer Sera at first. He just stared at the comm unit as if it had bitten him. When he finally looked up, his face was stark white.

"Mike?" Sera asked, already bracing. "What is it?"

"We need to get out of here," he said. "Now. Time's up. We've got to get this crystal into the mainframe to decrypt it—otherwise it's Armageddon."

Before anyone could react, a shudder ran through the floor. Dust drifted from the ancient ceiling as a low groan rolled through the buried chamber.

Jacob steadied himself against a column.

He met Mike's eyes and didn't bother arguing.

"Alright. You may be right. Move it—everyone out!"

They hustled down the long, cold corridor toward the exit. Rafi carried the scanner under one arm like a football; Sera kept a hand on his shoulder to steady him in the dim lights. The air was thin and bitter in their helmets.

Behind them, Lewis clattered along, the drone's rotors humming in a nervous stutter. He was bringing up the rear, watching Sera's back. But as they reached the outer archway of the library, Lewis abruptly stopped.

Sera spun. "Lewis? What are you doing? Come on!"

The drone stayed rooted, facing a short side alcove half-hidden by collapsed masonry. Its sensor array glowed amber—fixated.

Jacob barked from the passageway, “Let’s go! We’re losing structural stability!”

But Sera had already stepped back toward the drone. “Hang on—what is it?”

The alcove was barely a meter deep, the remnants of a doorframe tilted inward. The panel must have been sealed once, but time coupled with the last tremor had torn it loose. Inside was a narrow closet lined with scorched conduits and dead interfaces. The closet was some kind of communications or maintenance bay.

Something glinted faintly in the dust.

Sera crouched, reached in, and lifted a small crystalline spindle, half-buried under debris. A data crystal—intact, by the look of it.

Jacob’s voice exploded in her helmet.

“Sera! For God’s sake—move!”

She straightened, crystal in hand, as Lewis chirped a sharp warning tone. Another ripple trembled through the floor.

Sera rushed out of the alcove, clutching the crystal to her chest.

“I’ve got it!” she shouted, just as a deep rumble rose from somewhere below.

And they ran.



The Marsquakes had faded by the time the team regrouped beneath the protection of the excavation dome. Vexa and Sandra waited at the comm station console, relief flooding their faces as the four emerged from the lift—dusty, agitated, but unhurt. The supports, done properly this time, had held.

“What happened down there?” Sandra asked, rushing toward them. “Your signals went dead during the last tremor.”

“We’ll explain on the way,” Mike said, breathless. “We need to get back to the lab. Now.”

They stepped into the pressurized garage, lights coming to life over two waiting transport rovers. Metal gleamed where dust hadn’t yet claimed it; the air smelled faintly of lubricant and recycled oxygen. Rafi sealed the inner airlock with a heavy clunk.

They split up. Mike, Sandra, Sera, and Rafi peeled off toward the first rover while Jacob and Vexa followed by Lewis moved to the second. Hatches swung shut, interior lights warming to life as each cabin pressurized with a soft rising hum.

Rafi keyed the remote. Overhead, the outer bay door opened. The atmosphere was sucked out in a long, violent hiss, scattering loose dust across the floor as both rover engines rumbled awake.

Rafi gripped the controls. “Hold on. I’m taking the shortcut.”

The rover lurched forward, tires gripping the red-packed soil as a thin plume of dust curled behind them. Inside, the only sound was the steady hum of the life-support fans and Mike’s uneven breathing.

Sandra leaned into the front, her expression sharpened by worry.

“Alright. Talk. What the hell is going on?”

Mike rubbed his face, trying to order the chaos.

“I just got a call from Lin. They found something buried in the *Eos* comm logs—an encrypted transmission from about a week ago. Sent from the *Astraeus* propulsion bay.”

Sandra, frowned. “Why a transmission from the propulsion bay?”

Mike hesitated. “The day I ran the *Eos* test data through Hawk, it kept repeating ‘pattern missing.’ What I didn’t know was that Hawk wasn’t done—it sent the DMD data directly to Eagle on its own. It’s hard-wired to solve the warp control problem, so that’s what it did. And now the *Eos* crew is about to run a warp test that might actually work—no thanks to anything they’ve done.”

Rafi pressed harder on the accelerator. The tower garage entrance was just visible now as a white glint against the red horizon.

“They moved the test up?” Sandra asked.

“To tomorrow morning,” Mike said. “We thought we had days. We don’t.”

Sera felt her heart thump uncomfortably. She still hadn’t mentioned the extra crystal she’d grabbed in those frantic seconds at the exit. In all the chaos she’d shoved it into a thigh pocket almost without thinking. And now, she barely remembered she had it.

She glanced out the window, letting the others talk.

In the front, Mike was still explaining.

“If the decrypted Martian data confirms the risk, any part of it, we can stop the test. Halverson still’s respected by the people that matter. He’ll get it shutdown.”

Sandra followed. “I’ll get the info to Dr. Kwan. The IRC influence will help. Maybe they’ll finally listen.”

“What if we can’t get that data decrypted?” Rafi asked.

Mike didn’t answer.

They crossed under the shadow of the tower, rolling into the lower-level garage. Jacob followed them in with Vexa and

Lewis in the second vehicle. The doors sealed behind them. Pressure equalized. Engines powered down.

For a instant, no one moved as the weight of the moment settled in.

Then Mike unbuckled.

“Let’s get that crystal hooked into the mainframe. Hopefully the extra horsepower will crack the data quickly.”

They filed out with urgent purpose, heading up the lift to Sera's lab.

CHAPTER 37



Eos held silent station over the dark curve of Earth, back in the exact coordinates of the failed attempt. The nervous anticipation was back, this time with a sharper edge. The previous failure was a vivid reminder that the universe is indifferent to human understanding.

The crew moved with practiced precision but without the earlier swagger. The abrupt change in leadership and whispers of dissent among the scientists had tempered their confidence. A few handed their roles to the backups, but most still considered the risk worth taking. They knew there would always be detractors claiming the test was unsafe.

Three hours remained until the next attempt. Three hours while the ship hung motionless against the stars, the entire world holding its breath, waiting to see whether humanity would finally break through or break apart.



Darkness had set in outside the science lab, stars bright beyond the thin haze. The energy level was low, everyone's excitement muted by the mainframe's slow decryption process updated on the central display. The progress bar inched forward like cooling lava. Doubt was setting in, along with a lingering acceptance—and a shade of guilt—that they might survive while Earth would not.

Jacob rubbed his eyes and sighed as the progress bar took a step backwards. “Even if we crack these files before dawn, what exactly do you expect to find? The Martians built all this, and it still wasn’t enough. Looks like they missed the warning signs same as us.”

Mike leaned over the console. “I’m hoping for a clue. Anything. Maybe they missed something in the data. Maybe someone tried to raise the alarm and was dismissed—just like us. But we’re running out of time.”

A glance at the monitor on the far wall showed the *Eos* launch video downlink, an inset with the bridge feed showed the countdown clock across the bottom already at 2:58:45, the seconds dropping with unnerving speed.

Sera, half-listening as she stared at the slow-moving decryption, felt something press uncomfortably in her suit pocket. She blinked, then froze. “Oh—wait.”

She reached into her pocket and pulled out a small, dust-etched crystal. Everyone turned.

Mike straightened. “Sera...where did that come from?”

She explained quickly—Lewis stopping at the threshold, the battered doorframe that had shifted in the tremor, the strange little compartment in the wall she’d only glimpsed just before Jacob dragged her away.

Without another word, Mike took the crystal, guiding it toward the scanner on Sera’s workstation. The device chirped to life, its interface lighting up in a wash of blue.

“All right,” he murmured, locking it in place. “Let’s see what secrets you’ve been hiding.”

Lewis reacted to the crystal’s activation. The sturdy drone lifted off its charging cradle with a soft hum, drifting to hover behind Sera as the scanner finished its sweep. The crystal’s

data initialized and six video windows blinked onto the wall display.

A montage filled the room.

Two exterior views from street level, one wide angle from the rooftop, and three interior shots from inside the library showing quiet halls lit in soft afternoon haze.

For a moment, it looked like nothing at all.

Pedestrians walked along broad avenues. Transit skimmers whispered past. Sunlight glinted off metal façades of a city now buried for eons.

“Middle of the day,” Jacob muttered. “Nothing unusual.”

Then almost everyone spoke at once:

“Fast-forward.”

“Skip to the end.”

Mike dragged the scrub bar, and the serene cityscape dissolved into a stammering rush of time. Hours poured by in seconds. Shadows crawled. Crowds thinned. And then—

The world broke.

The exterior feeds erupted first: violent wind shearing through the streets, people staggering for shelter, debris spiraling upward instead of falling. The ground shuddered; the cameras trembled in their mounts, image warping as tremors rolled beneath them. Indoor feeds showed shelves collapsing, dust billowing as lights blew out one by one. Then nothing.

“That’s it,” Sera breathed, leaning forward. “We’ve got it.”

Mike swallowed hard. “This might actually convince them—if we could just...Sandra. What would it even look like?”

Sandra didn’t take her eyes off the screens. “Not the hole itself. That would be invisible. But gravitational lensing? A distortion in the sky. Small. Fleeting. The air might—bend.”

“Show us,” Rafi said softly.

Sandra rewound the rooftop camera. Slowed it. Advanced one frame at a time.

Lewis hovered closer, chirping in low bursts as if urging them on.

Sandra froze the image.

“There.”

The room fell completely silent.

Above the skyline, just for a few frames, the clouds warped inward, curving unnaturally around a point of nothing. A circular shimmer, a tightening ripple in the air as light itself bent around an unseen well.

Then the distortion vanished—
—and the chaos began.

Sandra stepped back, voice barely above a whisper. “There it is. Proof. They generated a black hole.”

Mike stared at the frozen distortion, his face draining of color as he glanced at the countdown clock.

Sandra exhaled sharply. “We have to contact Halverson. Get this recording to Dr. Kwan.”

Mike shook his head. “Too late. Bureaucracy won’t save anyone now. We go straight to Fleet Command.”

He opened a channel. The holo flickered then resolved into Rhea and Lin standing on the *Astraeus* bridge, light panels pulsing behind them.

“Rhea, listen,” Mike said. “We have proof. A singularity—”

“We can’t get anything through,” Rhea cut in. “*Eos* is in final countdown. The whole spectrum is saturated with test-specific traffic. They’ve locked every Fleet band.”

Lin stepped closer into view. “Maybe Hawk can terminate the test. It slipped in before. No one noticed.”

Mike glanced at Sandra; she nodded. “Rhea, patch me through to Hawk.”

“Hawk, terminate *Eos* countdown,” Mike ordered. “Priority override.”

The voice that came back was flat and calm. “Request denied. Pattern is complete.”

Sera turned and glanced toward Lewis. The drone bobbed once as if understanding.

“Mike,” Sera said quietly, “teach it.”

“That won’t work,” Mike insisted. “Hawk isn’t that kind of AI. It’s a warp controller. It sees the black hole as a ‘successful control state.’ It doesn’t recognize danger unless it’s in the model. It can’t—”

“Teach it,” Sera repeated. “Show it the video.”

Mike hesitated, then pulled the video feed from the crystal and streamed it to Hawk.

For a few seconds, nothing. Then:

“Termination command pending.” Hawk said.
“Authorization code required.”

Mike closed his eyes. “Of course. The AI is instructed to request authentication for any command that contradicts the core directive.”

Sera frowned. “Where are the codes?”

“In the codebook,” Mike said. “Locked in the safe on the bridge. Two paired quantum keys. Rhea has one. I have the other.”

He lifted the slim chain from around his neck with the quantum cylinder dangling from it.

Rafi blinked. “Seriously? A physical codebook? Keys?”

“It’s the most secure solution,” Mike said. “Completely air-gapped. No network. No backdoors.”

“Won’t Eagle also require the *Eos* authorization code?”
Sera asked anxiously.

Mike just looked at her and shrugged. There was nothing they could do about that now.

No one spoke for a moment.

Then Vexa, quiet all this time at the edge of the group, stepped forward. "I'll take the key to *Astraeus*."

"What about the shuttle schedule?" Sandra asked. "The departure schedule—"

"Don't worry about it," Vexa said with a small, sly smile. "One of the shuttle commanders on duty today is sweet on me. He'll take me."

Sera looked at her. "You're sure?"

Vexa nodded once. "Let's save Earth."



Lin's voice came through the lab audio system, steady but edged with strain. On the holo feed from *Astraeus*'s bridge, he was hunched over the engineering console. "Mike, we've got another problem."

Mike closed his eyes for a beat. "Of course. What is it?"

"Hawk needs a transmit channel it can ride into *Eos*'s systems without being flagged by their security filters." Lin tapped a control and brought up a window beside him. "Our best bet is the live video feed coming from the *Eos* command deck. We're getting that in real time through QuNET."

Mike looked over at the monitor with the same feed.

"Right now, that stream is downlink-only," Lin said. "But if we flip it to full duplex, Hawk can push a return signal through the same pipe and find a route to the HQC."

Mike answered, "OK, what's the catch?"

Lin responded. "The video's being routed through the LTR. *Eos* transmits the live feed to the receiver on the Moon. That

feed is full duplex so the control room can pan the camera. The range relays it to Earth and Mars as simplex. That's the problem. The switch to change the downlink to duplex has to be performed locally."

Mike's stomach tightened. "Meaning someone working the LTR has to physically do it."

"Correct." Lin zoomed in on a schematic. "And when they command the transceiver, the feed will blip for a second. Anyone watching the feed could notice something's off."

Rafi muttered, "Fantastic. So we need a comm tech on the Moon willing to break protocol during terminal countdown and then hope nobody notices."

"It has to be done," Lin said. "If we don't establish that return path, Hawk can't get into *Eos's* network to issue the shutdown command."

Jacob gave a low whistle. "Hell of a bottleneck."

Lin met Mike's eyes through the video feed. "But it's the only option I see, and the window is closing fast."

Mike exhaled. "Alright. Then we find someone willing to take the risk."

CHAPTER 38



The bridge of *Eos* was running at a low, electric hum. Everyone quietly went about their tasks, but the tension seemed to reverberate through their consoles. The lights were dimmed to mission mode, bathing the crew in a cool blue wash that made the displays glow cold against their faces.

Engineers murmured final checks while status icons updated on the center holo console: reactor stable, field emitters nominal, warp coils climbing toward full charge.

Above it all hovered the countdown clock, projected like a hovering shard of ice over the bridge pit.

T-00:49:12... 00:49:11... 00:49:10

Each second fell away with mechanical certainty, drawing them closer to activation.

No one spoke about the previous failure out loud. But it lived in every stiff movement and clipped response, in the way the captain kept glancing toward the viewport as if the void itself might judge them.

Eos was fully committed now. Every system ticked forward with practiced precision, unsettlingly familiar.



Rhea sat forward at the *Astraeus* comm station, eyes scanning for any thread of unused bandwidth to contact the lunar range operators. Every official channel was locked to *Eos* mission frequencies.

Then she found it.

A small bandwidth, low-priority packet stream hopping through a civilian relay. A gaming server of all things, originating from the lunar range facility.

She slid into it.

Fortunately, on a Fleet starship in the Mars system, she had access to the QuNET zero delay messaging service.

FLASH ZULU: CONTACT ASTRAEUS. MARS QUNET CHANNEL 689. IMMEDIATE ACTION REQUIRED.

A moment later a message response popped into her queue on the new channel.

“*Astraeus* why were you flash messaging via a private guild channel?”

“Are you on active duty at the LTR? Comms monitoring?” she typed, skipping the preamble.

A pause. Then: “Yes, what’s this regarding?”

“This is Commander Rhea Imani of the *Astraeus*. We need your help regarding an urgent situation with the *Eos* flight test.”

“OK, copy, Commander. Please transmit Fleet identification chain and authorization code.”

“We don’t have a code,” Lin muttered beside her, rubbing his temples.

Rhea transmitted her digital ident without the code. “We require a duplex reset on the *Eos* bridge camera downlink. We need you to change the channel configuration from the baseline.”

“Yes, Ma’am. Understood. But I need proper authorization. Your credentials check out, but I need a code.”

Rhea exchanged a look with Lin. No time. No code. No other options.

“Send it,” she told him.

Lin uploaded the compressed videos to the message stream containing all the camera clips from the Martian library. The panic in the streets, the chaos inside, the moment the sky bent, twisted, and fractured around the tiny gravitational lens, then the world ended.

The channel went silent.

Seconds stretched.

Then the message appeared.

“That was for real?”

“It will happen again,” Rhea typed quickly, “in forty-five minutes. And this time it won’t be Mars.”

Another beat.

“Are you serious? A duplex switch will stop that? You know the security protocols here are elevated. You and everyone aboard *Astraeus* were nearly killed, but you saved them. You’re a legend around here.”

Rhea could now sense she had a chance. She took one final shot.

“Do you want to be responsible for what you saw happening to Earth? I’m sure you’ve heard the rumors about the danger. The clock is counting down. There’s no time to explain. You need to decide.”

“Okay. I’ll do it. Give me twenty seconds to access the control interface. The video feed will blip when I switch it. If anyone asks, you never messaged me.”



In the Mars science lab, the room was silent except for the hum of equipment. Sera stood with Jacob, her arms folded tight. Rafi hovered by the monitors. Sandra watched the timer. Lewis drifted just above its charging cradle, vibrating with a soft anxious whir.

Aboard the *Astraeus*, Rhea and Lin leaned in over the downlinked video.

The *Eos* bridge crew went about their work, checking displays, running callouts, seemingly unaware they were being monitored by half the solar system.

The timer in the corner read 00:36:17.

Then—

A brief ripple in the feed. A half-second smear of pixels, a blink, a hiccup in the image.

Everyone on Mars sucked in a breath.

Everyone on the *Astraeus* froze.

At the MCC, Comm entered a note in the log.

On *Eos*, no one even looked up.

The feed steadied. The countdown continued, steady and merciless.

00:36:16 ... 00:36:15 ...



Mike paced behind the console, eyes flicking between the countdown and the *Hubble* docking bay camera.

“What the hell is taking her so long?” he snapped.

Sandra checked her tablet. “Her shuttle’s holding. They’re waiting on docking clearance at *Hubble*. Off-schedule traffic has to queue.”

“Queue?” Mike barked. “We’re fourteen minutes from activation!”

Jacob muttered, “They don’t know we’re trying to stop the end of the world.”

Rafi hovered near the monitor, hands clasped tightly. “Tell her to push them.”

Before Sandra could reply, the comm panel chimed.

“She’s cleared!” Sera shouted. “Docking sequence initiated.”

On the screen, the tiny shuttle drifted toward the *Hubble* station, thrusters firing in gentle pulses.

The *Eos* countdown ticked down with mechanical indifference.

00:13:52 ... 00:13:51 ...



Vexa floated onto the *Astraeus* bridge, still in her jumpsuit saturated in red dust. Rhea grabbed her and guided her to the captain's console.

“Seven minutes,” Mike said over comms, his voice taut.

Vexa yanked the chain with Mike's key from around her neck and latched in beside Rhea. The two women exchanged a quick, urgent nod.

“On three,” Rhea said. “One... two... three.”

The two entangled cylinders slipped into the waiting slots. The safe gave a heavy metallic clunk and its thick door released. Inside sat the absurdly analog object their entire plan depended on: a well-worn, paper code book.

Rhea snatched it out and began flipping through the laminated pages with trembling fingers.

“Come on, come on...” She muttered numbers under her breath, scanning columns, cross-checking prefixes, turning pages so fast one nearly tore. “Where is it—ah! Got it!”

She practically slammed the book onto the console, typed the long authorization string into the waiting prompt, double-checked it, then hit enter.

For a heartbeat nothing happened.

Then Hawk's voice came through the bridge speakers, calm as ever.

"Authorization confirmed. Executing."

Mike exhaled shakily. On the *Eos* feed, the countdown marched on.

00:03:11 ... 00:03:10 ...

"Three minutes," Rhea whispered, staring at the monitor.

"Hawk, please hurry."



Hawk's signal path originated at the *Astraeus*'s transmitter, reaching the Mars qubit containment field in a heartbeat. From there it crossed the vastness of space instantly as the entangled qubits in the lunar field synced. Now moving as a conventional bit stream, the signal threaded its way through the range's internal comm network—a maze of routers, relays, and diagnostic firewalls too preoccupied with *Eos* telemetry to notice the stowaway in their stream.

From there the signal was passed to the lunar uplink transmitter, boosted, collimated, and fired across cislunar space toward the test vehicle.

It arrived at *Eos*'s forward receiver as just another stream in the torrent of mission data, slipping through unchallenged. Then, without disturbing a single pixel of the broadcast, the packets slid down the spine of the bridge camera uplink, using it as an access point into the ship's secure internal network.

The countdown rolled past T-2:00.

Once inside the ship's network, the AI moved like a razor through silk. In milliseconds it located the HQC, where Eagle, dormant in the propulsion control domain, was awaiting for activation authority.

The authentication handshake pulsed from Hawk to Eagle.
Link established.

Hawk transmitted the termination directive in a single, silent burst.

Eagle processed the instruction.

Authentication confirmed. Directive accepted.

T-1:00 and counting...

CHAPTER 39



The countdown clock dominated the forward displays, each digit pulsing in red as it devoured the final seconds.

T-00:10... 09... 08...

The bridge crew sat rigid at their stations, eyes locked on their boards, the air thick enough to feel. No one spoke. No one breathed.

03... 02... 01...

The clock hit zero.

The captain placed her hand on the command nexus, voice steady but threaded with anticipation.

“Eos, activate warp drive.”

The command propagated through the consoles in a cascade of soft tones.

Then—

Nothing.

No rumble from the power distribution network.

No harmonic rise from the warp coils.

Just silence.

A chime cut through the stillness.

All eyes snapped to the HQC status display as its indicator flashed amber, then stark red.

Across the screen, in clean, uncompromising text, appeared a single message:

PATTERN UNSAFE

For a full second the command deck froze—startled, confused, and unsure what they were seeing.

Then a cold ripple passed through everyone as they realized the same thing—the system stopped itself.



For a breathless moment, no one moved. The bridge crew on the *Astraeus* stared at the frozen PATTERN UNSAFE alert on the *Eos* feed, then Rhea let out a laugh that cracked into a shout.

“We did it! Hawk did it!”

A ripple of cheers burst across the deck. Rhea hugged Lin, and a wave of relieved, laughter filled the command pit.

Rhea slumped back in her chair, wiping her eyes. “I can’t believe that worked.”

Vexa leaned over and bear hugged Rhea, even though they’d never met.

A surprised message from the still open LTR link appeared, “Commander, I think the warp test just aborted. Was that us? We’re in big trouble.”

“Exactly! You just saved the world,” Rhea typed unable to resist the addition of several happy face emojis.

“Ok, Commander if you say so.”



Back in the lab, the tension shattered just as abruptly. Out the viewport, the white sun, wrapped in a stunning blue halo, peaked above the horizon.

Sera covered her mouth with both hands as relief washed over her. Jacob wrapped Rafi in a hug he hadn't anticipated but tolerated anyway.

Sandra just stared at the screen showing the stalled *Eos*, her shoulders trembling before she let out a shaky breath. "Thank God...thank God."

Rhea's voice echoed through their speakers from the *Astraeus* bridge, breathless and joyful. "It worked! *Eos* aborted!"

Lewis let out a cheerful chirp, lifting lightly from its charging cradle and spinning in a celebratory circle above Sera's head. She laughed, tears streaking down her cheeks.

Rafi ran both hands through his hair, half laughing, half crying. "I'm giving everyone a raise," he declared to no one in particular.

Jacob pointed at the time-stamped feed. "If we were thirty seconds later—"

"—we weren't," Sera cut in, firm. "That's what matters."

Mike leaned against a console, exhausted beyond words. Sandra clasped his shoulder.

"Captain..." she said softly. "You just saved the world."

Mike shook his head. "We all did."

CHAPTER 40



Mike relaxed with a glass of wine in the backyard of his home on the Viotto estate, watching his daughter wobble her way across the grass with the determined concentration only a toddler could muster. The vines rolled green and gold along the hills beyond. The moment was peaceful in a way he was learning to treasure.

He thought about what had happened two years ago. There were no commendations, no medals, no reckoning. That was fine. History would get around to sorting out what happened aboard *Eos* and *Astraeus*. Fleet Command and the WDC did not publicly admit how close they'd come to scouring half the solar system, or acknowledge the security failures that allowed Hawk to slip into *Eos*. Instead they praised the engineering of the HQC, declaring the pattern-recognition protocols uncovered a flaw in human logic. Mike couldn't really argue. That was an accurate description of the AI's evolution.

Now they were preparing the next attempt far beyond Saturn's orbit. Halverson's estimate of years had sounded like hyperbole, but here they were two years later and still not ready. The deep-space infrastructure needed to support the operation was brutally difficult to implement. Now no one questioned why it had to be done carefully. And no one was in a rush. Extraterrestrials were real. An ancient civilization had lived and died on Mars. The Swannies were warping near Planet 6. Humanity wasn't the lonely species it was just

two years ago. Maybe, Mike thought, we were ready for the leap. But the past two years had not changed people as much as he had hoped.



The scientists could still not entirely explain the physics of the singularity that enabled the stable warp field. Sandra finally make it to Nome to meet with Dr. Weiss.

Unsurprisingly, the visit did not provide much in the way of answers, and Weiss died soon after of natural causes.

Something about the nature of the singularity had allowed the micro-size black hole to form and evaporate instantaneously in the test chamber, but required Hawk's solution to function at starship scale. Mike felt that was the key to finally unlocking the mystery.

The DMD on Kepler confirmed their findings from the FSA. Sandra became the first to prove the existence of an active FTL-capable civilization in another star system. For that she won the Nobel Prize in Physics. She insisted that he and Helena attend the ceremony in Stockholm. He tried to refuse; Helena overruled him. During her acceptance speech Sandra quietly acknowledged him for saving the world. Few appreciated the veracity in what she said, and that suited him fine.

There were protests outside the hall. People who, despite everything that happened, still denied the existence of the extraterrestrials and hailed the recent warp failures as a warning. Healthy skepticism was fine, Mike thought, but why were some people so selective about what they questioned?

Perses was on her way back from the survey in the Kuiper Belt. Everyone was anxious to learn if the material recovered

in orbit around the stellar-mass black hole was of Martian origin. Regardless of the conclusion, there would still be another mystery to unravel.



The *Astraeus* warp drive integration was completed prior to returning to Earth. Now she was docked back at *Kepler*, undergoing another round of upgrades on the fusion drive. Lin was working with Nat on some ideas to improve the efficiency. Mike still didn't understand how that man ever ended up doing instrument work on *Kepler* when he should have been leading a design team. Rhea remained on-board as First Officer. She seemed more at home on *Astraeus* than anywhere planetside.

Whether *Astraeus* or *Eos* would make the first FTL jump was still undecided. They offered Mike the captain's chair for the test. He hadn't given them an answer yet. There was a lot to consider.

Rafi was running a literal gold mine on Mars. Since the underground site had opened to tourists, travel to Mars exploded. With Helena's help, Mars—by some people's definition—was a new civilization, complete with a wine industry that shocked a few Earthbound judges. The quantum data crystals from the buried library were finally decrypted. Sera was now collaborating with planetside archaeologists, publishing a paper every few months, slowly reconstructing the history of a people whose arc echoed humanity's in unsettling ways. They were hopeful of finding a fossil record preserved beneath the ice to supplement the history stored in the library archives.

Jacob had earned enough for his family to guarantee he would never set foot in another mine, yet he was still on Mars, guiding tours through the buried city, telling wide-eyed visitors how he once helped save the world. Mike suspected the stories grew a little each year.



Mike sometimes wondered if it had all happened for a reason, but he knew the universe didn't operate that way. They were extremely fortunate that the events played out like they did.

He tried to put everything in perspective. Maybe that wasn't possible anymore. Too much had changed. Too much had almost ended.

Now humanity stood once again at the edge of a moment that could redefine everything, preparing for the greatest leap in history, only a few years after it had nearly destroyed itself trying.

Mike watched his daughter chasing a butterfly in the garden and decided that, if he went, it would be for her.

The crew of the *Astraeus* will return in *Warp Discovery*.

TECH NOTES

Astronomical Unit (AU): AU is a standard unit of length defined by the average distance between the Earth and the Sun, and remains a constant value regardless of where in the universe it is used.

Cosmic Microwave Background (CMB): The faint, uniform radiation remaining from the Big Bang that cooled and stretched into microwave wavelengths over the 13.8 billion years of cosmic expansion. This “first light” was released roughly 380,000 years after the Big Bang when the universe cooled and became transparent. The CMB radiation was discovered by chance in 1965 by Arno Penzias and Robert Wilson, two American radio astronomers. Their radio telescope registered a signal that could not be attributed to noise or any precise source in the sky.

Dark Matter Detector (DMD): An instrument that determines the presence of dark matter in the Field Of View (FOV) by detecting gravity very precisely, and subtracting the amount of gravity attributable to normal matter present. The remaining gravity is then used to infer the presence of dark matter. The detector is modified to take the process one step further, inferring the presence of ionized dark matter by eliminating all ionization patterns attributable to normal matter in the FOV.

Warp Drive: Faster Than Light (FTL) travel created by warping the fabric of spacetime. The spacetime in front of the vehicle is contracted, and the spacetime behind the vehicle is

expanded, creating a warp bubble surrounding the ship. This process leaves a halo of ionized dark matter in its wake. Since spacetime is warped, no relativistic time dilation occurs.

Forward Sensor Array (FSA): A large array of sensors located beneath the forward section of the spacecraft capable of being reconfigured for the remote analysis of matter or electromagnetic energy (or both simultaneously at lower resolution). The array can be articulated through an extendable 3-axis gimbal.

Control Moment Gyroscopes (CMG): Large gyroscopes which are used for stabilization of the starship and counter-balance attitude distortions induced by the spinning rings and other disturbances without requiring the use of thrusters.

Counter-Balance Flywheel (CBF): The habitat ring rotation creates a precession in the ship's orientation. In order to avoid unnecessary expenditure of energy to continuously counter-act the precession, the flywheel is spun in the opposite direction to the habitat ring. The flywheel is at a much smaller radius than the habitat ring, and therefore must be more massive. Like the habitat ring, the flywheel is installed in space during final spacecraft integration to reduce launch mass. Both rings can be magnetically braked if necessary. They can be individually spun up by the fusion reactor using electromagnets when the reactor is not being used for propulsion.

Direct Fusion Drive (DFD): The ship's fusion reactor combines light elements (Deuterium — Deuterium, or D-D)

to form helium, releasing energy. The reaction produces charged particles (helions) and neutrons. Magnetic fields in the nozzle guide the ions out the nozzle, creating powerful thrust with minimal fuel. D-D is used because of the abundance of deuterium in ice on stellar bodies, although the reaction requires more energy to initiate and produces waste neutrons that make surrounding reactor material radioactive. The DFD is only fueled and activated in deep space. Therefore the starships require external detachable boosters to reach orbit from Earth.

Columbia-class starships: The first generation of Fleet starships. Each have a single deuterium fusion reactor, one habitat ring, two tugs, first generation FSA, with three fusion plasma powered engines. (*Astraeus* has an upgraded reactor, warp generator coils added externally, and warp field emitters added to the periphery of the habitat ring.) The starships are built on Earth, the habitat rings are built in space. The rings are not designed for ground based launch or atmospheric reentry. The starships are not designed for atmospheric reentry either, although they can survive a reentry in an emergency.

Orion-class starships: The second generation of Fleet starships with an upgraded next generation deuterium fusion reactor, 4 fusion engines, warp coils integrated into the propulsion system, a larger habitat ring with integrated warp field emitters, 2 tugs, and a second generation FSA.

Reaction Control System (RCS): Small thrusters used for precise orientation and maneuvering in space, providing control over pitch, yaw, and roll (attitude control) where

main engines cannot, and for delicate tasks like docking. They work like small rocket motors, firing in opposite directions or together to rotate or nudge the spacecraft.

Orbital Maneuvering System (OMS): The OMS uses small rocket engines to control orbit and trajectory, providing thrust for major orbital changes like insertion and circularization, as well as rendezvous and station-keeping maneuvers, by adjusting velocity, altitude, and inclination.

Fusion Power Generation: Power generation from fusion of hydrogen fuel where substantially more energy is produced than input, making the generator economically viable. Solved the energy and climate crisis on Earth, and woke the global economy ending The Great Decoupling. Enabled more investment in space and exploration.

Infrared Synthetic Aperture Telescope (IRSAT): A high resolution space telescope using multiple precision controlled satellites to form a virtual very large mirror. The array orbits the Sun-Earth L2 Lagrange point and is capable of accurately resolving atmospheric composition of exoplanets.

Space Elevator: Transport mechanism between Earth and space using a space tether fabricated from carbon nanotubes, stretching from the Earth's equator to geosynchronous orbit. Passengers and cargo travel between Earth and the orbiting station using a pressurized climber car that docks at the geosynchronous station. A shuttle craft then transports the passengers or cargo to the final destination. The trip takes several days, but is extremely efficient compared to traditional methods requiring chemical rocket engines.

Stellar mass black hole: A black hole (a gravity well from which nothing can escape) with the equivalent mass of the Earth's Sun (1 solar mass). There are no known events that can form a black hole of this mass, as sun size stars are not massive enough to collapse into black holes. It's possible conditions existed during the rapid expansion (inflation) of the universe after the Big Bang that could have created them.

DNA glass: A cutting-edge material where DNA nano-structures act as a scaffold, coated with silica glass to create an ultralight, transparent, incredibly strong composite, stronger than steel.

Heterogenous Quantum Computer (HQC): The HQC is a powerful state-of-the-art computing platform, providing a synergistic combination of classical silicon based sequential processing with quantum based parallel processing essential for the AI training.

Habitat Domes: On Mars, the residents and the primary mining sites are contained within large glass habitat domes. The transparent glass is made of two panes with water flowing between the panes. This efficient solution provides many advantages including water storage, radiation shielding, insulation, plus providing natural sunlight for agriculture and human psychological benefits.

QuNET: The Moon to Mars network utilizing entangled qubits. The system works by establishing pairs of entangled qubits then separating them in containment fields on the Moon and Mars. The process of establishing the entangled

bits is costly and time consuming so the number of bits available is limited, restricting the bandwidth available. The zero delay transmission occurs by toggling a qubit in one location with its corresponding entangled qubit in the other location toggling states concurrently regardless of the distance between them.

High-Temperature Superconducting (HTS) cables:

Conductors that offer vastly reduced mass, size, and virtually zero energy loss compared to traditional copper, providing efficient, high-power distribution. They carry massive currents with no heat, enabling smaller, lighter power systems and operate at liquid nitrogen temperatures (a relatively “high” temperature for a superconductor) making them lighter, compact, and incredibly efficient for spacecraft.

Hardware-in-the-Loop (HIL) simulation: A simulation technique used by engineers to evaluate the performance of the actual flight hardware in as close to actual flight conditions as possible. This is an established method to tune the flight hardware performance without risking the vehicle and possibly human life.

Orbiting Tanker Vehicle (OTV): OTVs are autonomous dedicated orbital fuel tankers launched from the Moon or Mars fuel refineries. They are fueled and launched on-demand, and return to the launch site autonomously once the fuel is off-loaded on orbit.

Line Replaceable Unit (LRU): The spaceship avionics are designed to be modular. This helps to minimize the number

of spares required to be carried on-board and facilitates easy replacement in the event of a failure. LRUs can perform many different functions dependent on the software load.

Lunar Test Range (LTR): A test range for experimental space vehicles monitored from the Moon. Placing communications assets on the Moon significantly enhances the safety, flexibility, and efficiency of deep space experimental test operations.

International Center for Warp Research (ICWR): The ICWR was founded by the forty nations participating in the decades long development of warp drive technology. The ICWR was established after scientists discovered methodologies that greatly reduced the theoretical assumptions about the energy required to warp spacetime (the Weiss Factor). Beneath the ICWR is the Warp Dynamics Integration and Test Facility (WDITF) where the theory was first proven at micro-scale.

Interplanetary Research Council (IRC): Once humans expanded deep into the solar system and the search for intelligent life in the universe accelerated, concerns about protecting the potential ecosystems of distant worlds became paramount. Multiple nations participate and guide the research efforts within the solar system and beyond.

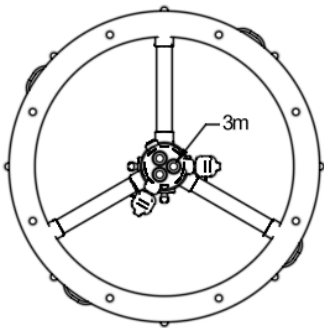
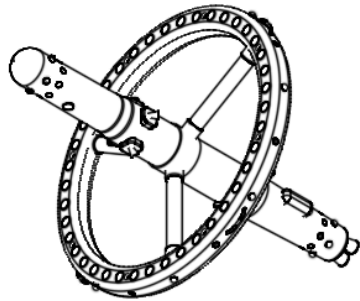
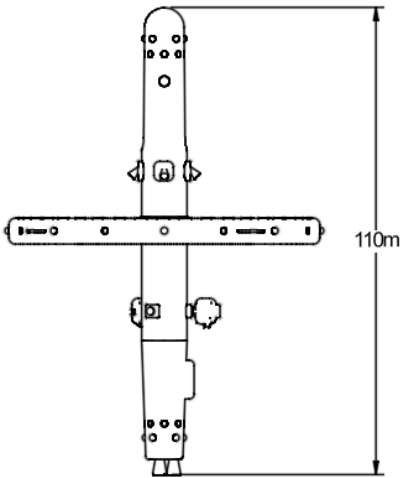
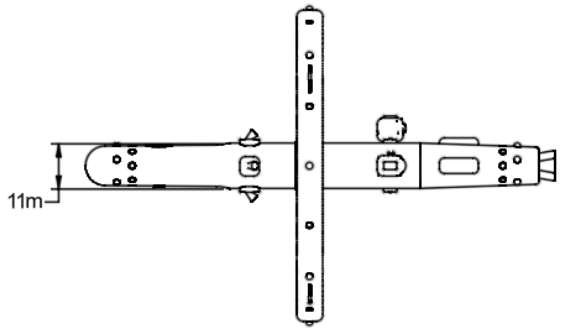
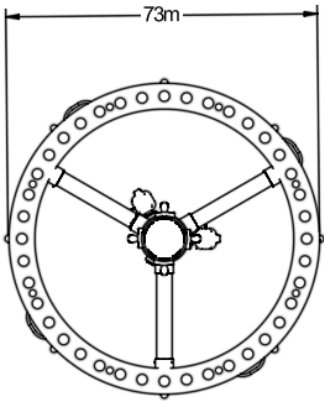
Warp Drive Consortium (WDC): The WDC is a public-private partnership formed by the leading space faring nations to move warp technology from the lab to flight test. Many engineers and scientists of the WDC are detailed from Fleet Command and the ICWR.

The Great Decoupling: During the Great Decoupling the world's largest economies adopted aggressive economic and political isolationism, dismantling long-standing trade, financial, and technological interdependencies. As supply chains fractured and cross-border capital, energy, and information flows were curtailed, global productivity collapsed and developing economies lost access to critical markets and investment. The resulting contraction triggered a prolonged worldwide recession and regional conflicts, marked by systemic supply shortages, currency instability, and the breakdown of multinational institutions that had previously provided some limited stability to the global economy.

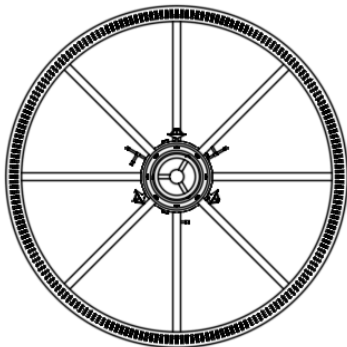
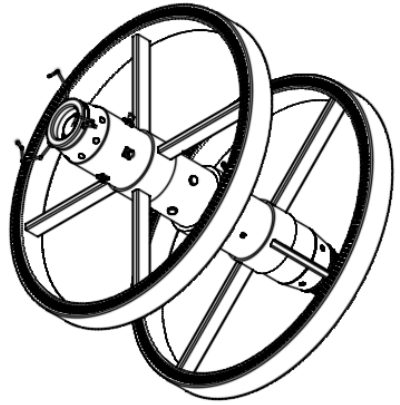
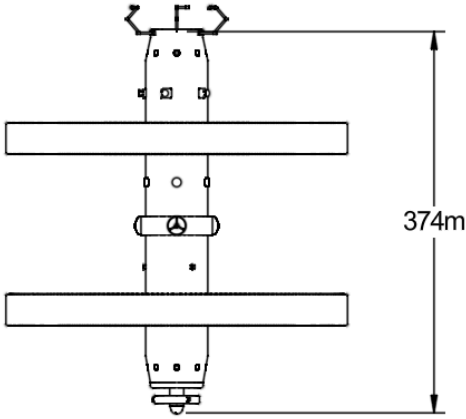
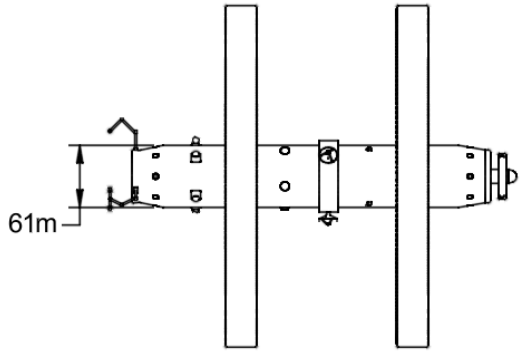
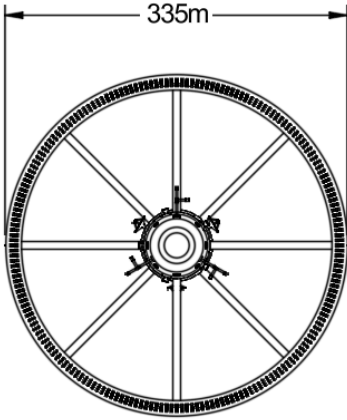
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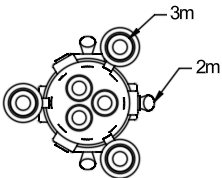
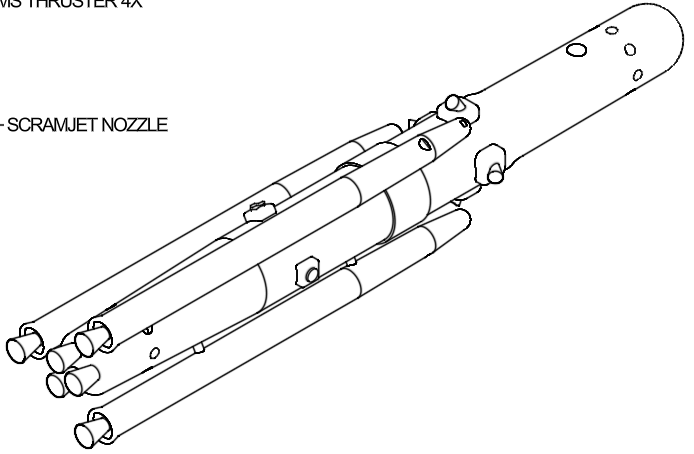
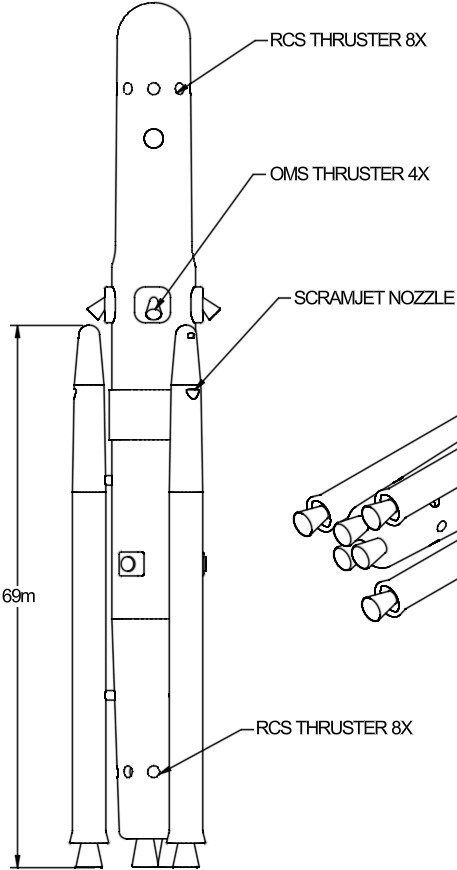
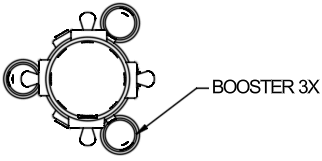
Matthew Redifer - Matt retired from NASA after 33 years. He is happily married to his wife of 25 years Saynne and has two adult daughters Samantha and Sabrina, both pursuing degrees in STEM fields at UCLA. They all currently live in Southern California. Matt had the privilege to work on numerous historical aerospace projects during his time with NASA including the Space Shuttles, Orion, Earth observing satellites, Earth science, and experimental X-planes. He is a graduate of the University of Southern California in Aerospace Engineering with a Master's in Electrical Engineering from Cal State Northridge. The novel, although set in a science fiction future, is influenced by his real world experiences.



Astraeus
Columbia Class Starship



Kepler Station



Astraeus Launch Configuration

