

God's Glass Ceiling

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L. Corin Hale

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CHAPTER 1

THE VANISHING POINT

Thorne had spent the morning refusing coffee, because the hand that held the cup had begun to shake, and he preferred not to account for it in front of his team. He stood instead at the back of the room with his arms folded in a posture he had borrowed, years ago, from a much calmer man, and watched the countdown run out.

The launch itself was, in the vocabulary of the trade, *nominal*. A word like a door closing. On the main screen the Ares I lifted off its pad with the unhurried dignity of something that had decided, at last, to stop pretending it belonged to the ground. White plume. Blue sky. The camera on the gantry swung sideways and caught, for a half-second, the reflection of the rising ship in the flood pond, already beginning

to boil.

“MECO on schedule,” said the flight director, and the room exhaled in the particular way that a large, well-trained room exhales when nothing has gone wrong yet. Someone clapped, briefly, and was hushed.

Thorne did not clap. He was aware, as he always was at launches, of a fraudulent stillness at his center — the appearance of calm performed for the benefit of younger engineers, who took their cues from him and did not need to know that he had not slept more than four hours any night of the past fortnight. His knees hurt. He had been standing since four. On the wall above the directorate, three clocks kept time in three time zones, and below them a fourth clock, newly installed, counted up in days-hours-minutes-seconds: *Ares I Mission Elapsed Time*. It read 00:00:03:12.

Seventeen years on that clock. If you counted the engine schematics he had doodled on napkins in the Princeton cafeteria. He had counted them.

“Stage two ignition,” said Tanaka’s voice, piped through the ceiling speakers with the faint mechanical purr of the downlink. Tanaka sounded the way Tanaka always sounded: like a man describing weather he had arranged personally. “Acceleration at 0.4 g and climbing. Trajectory holding steady.”

"Copy, Ares I. Looking good from Houston."

The flight director — Vikram, a man Thorne had promoted twice and would promote once more before they were done — allowed himself a half-smile and did not turn around. Thorne appreciated that. It was the right size of smile.

On the secondary screen, the trajectory plot resolved itself into a hairline arc, green against black, reaching up through a cloud of orbital debris toward the small bright circle labeled *Moon* — *T+54h*. Beyond the Moon, the arc continued in dashes for another six weeks of travel, stretching out to a second circle, labeled with a word Thorne had refused to say aloud for most of his adult life, because saying it aloud made it a promise one could fail.

Mars.

He said it now, under his breath, and nobody heard him. It felt like a small, secret permission.

Across the room, Anya Sharma caught his eye. She did not smile either. She had the habit, acquired over two decades of watching pilots and astronauts from behind one-way glass, of cataloguing faces during moments of relief, because she claimed — and she was not, in Thorne's experience, often wrong — that you learned more about a person from the face they wore after a crisis than during one. She was

wearing that cataloguing look now, on him.

He lifted his chin slightly, which was their private signal for *I am fine, Dr. Sharma, please attend to someone else*. She raised an eyebrow. It said *we'll see*.

"TLI burn in four minutes thirty," said Vikram. "Everybody breathe."

Everybody breathed. Thorne watched them breathe. On the big screen the Ares I continued to exist, which was, if you thought about it, a small miracle repeated every tenth of a second by approximately four hundred people in three countries, each of whom had, this morning, an opinion about a specific bolt.

He allowed himself, for the first time in nine years, to not have an opinion about any of the bolts.

"Commander," he said into his headset, pressing the button that patched him through to the cockpit. "Dr. Thorne here. Just wanted to say — congratulations, Ares I. She's flying well."

A beat. Then Rostova, dry: "She's flying, Dr. Thorne. We'll save *well* for when we're home."

"Noted, Commander."

"Appreciated, though," Rostova added, in a tone that made Thorne look down at the toes of his shoes for a moment. "All of it. All of you. We'll take it from here."

"Copy, Ares I."

He released the button. Someone had placed a cup of coffee on the console beside him while he wasn't looking. He picked it up. His hand did not shake. He drank.

Triumph, he thought, was a word he had always distrusted — it belonged to generals and football coaches and inviting the weather — but if the word applied anywhere in the long catalogue of human follies, it applied to this one, today, in this room. He permitted himself the word, privately, the way one permits a child a small indulgence, and he set the coffee down and did not drink from it again.

On the screen, the trajectory ticked one thin increment forward.

The first two days were, by the standards of crewed spaceflight, boring. Thorne considered boredom the highest achievement of his profession.

He slept at the facility. He had a cot in his office that predated the mission and would, he suspected, outlive it, and he lay on it for four-hour intervals with his shoes beside him on the floor and one hand resting on the pager the mission provided, which did not ring. The TLI burn had completed cleanly. The

Ares I had swung out past the Moon on the morning of day two and crossed into the long slow cruise toward Mars, its ion drive now doing what ion drives do, which was to push gently and continuously and with the mild pedantry of a physics professor who will not be hurried.

“Trajectory holding steady,” said Tanaka, every six hours, in what Thorne had come to suspect was the same recording looped.

“Ares I, Houston. Confirm.”

“Confirmed, Houston. Same as it was.”

In the mornings and evenings, the crew did science. This was the part of the mission Thorne found most restful, because it involved four adults with doctorates doing their jobs at a distance where he could no longer usefully interfere. Hanson ran spectral sweeps on the space between the ship and the Moon, because they were passing through a region nobody had sampled at this resolution before, and because Hanson believed — correctly — that interstellar vacuum was interesting if you looked at it hard enough. Jones tracked gravitational perturbations and mapped the long slow curve of local gravity, leaning on his gravimeter with the patience of a man listening for a heartbeat in a thick wall. Rostova managed them. Tanaka flew.

On the evening of day three, Hanson called down for Reed.

"Dr. Reed, are you there?"

Evelyn Reed swiveled up from her console. She had the kind of face that had been sharpened rather than aged by forty years of astrophysics: lean, alert, a permanent small furrow between the brows. "Here, Dr. Hanson. Go ahead."

"I've got an energy signature I can't place. It's faint. I wouldn't have flagged it except it doesn't match anything in the library."

"What band?"

"All of them. That's the problem."

Reed went still in the particular way she had when she was doing arithmetic in her head. "Say that again."

"It's broadband," Hanson said. Her voice through the downlink was small and clean, the way the downlink made everyone sound: as if they were speaking from the bottom of a very deep and very clean well. "A continuous signature across the spectrum. Very low amplitude. No polarization I can isolate. It's not periodic. It's not modulated. It's just — present. Like background noise, except the background noise we came in with is..." She paused. "Quieter than it should be."

“Quieter.”

“The CMB’s reading about a tenth of a kelvin under expectation. I re-ran it three times. Then I looked at the local radio background, and it’s down too. Not much. Not enough to call anything. But it’s consistent, in the direction we’re heading, over the past twelve hours.”

Reed’s furrow deepened. “Dr. Hanson, are you telling me the universe is getting quieter?”

A small laugh, without much in it. “I’m telling you *my* universe is getting quieter. By a very small amount. I thought you’d want to know.”

“Send me the data.”

“Sending.”

Thorne, who had been reading the same paragraph of a maintenance log for several minutes without absorbing a single word of it, set the tablet down and walked over. Reed did not look up. The graphs were already blooming on her screen in three colors: raw, smoothed, residual. She scrolled through them with the tip of a pencil tapping against her lower lip.

“Anything?” Thorne said.

“It’s nothing,” Reed said, meaning *it is almost certainly nothing*, which in her dialect was a different sentence from *it is nothing*. “The amplitude is below what

I'd call significant. I'd suspect instrumentation first. A thermal gradient on the detector. A software filter miscalibrated. Anything."

"But."

"But Hanson doesn't flag instrumentation. She's careful."

"Ask her to flag it if it grows."

"Already asked."

He stood a moment at her shoulder, looking at the smoothed curve, which did indeed trend very gently downward along the ship's heading, like a floor that was not quite level. The slope was so slight that if someone had shown him the graph without context he would have called it drift. With context, he still wanted to call it drift. Context had a way, he reminded himself, of manufacturing patterns.

"Keep me posted," he said.

"Precisely," Reed said, borrowing his word, and he permitted himself a half-smile he did not let her see.

He went back to his cot. He did not sleep.

On day four, Jones called down about his isotopes.

"Samuel," Reed said into her mic. "Go."

"It's probably nothing," Jones said, who also did not say *nothing* lightly. He sounded, Thorne thought, a little tired — the first human inflection in a voice Thorne had up to this point been unable to distinguish from a metronome. "I've got a run of isotope readings I can't account for. I'm looking at the reference sample we brought up for calibration — the standard cocktail. I've been running baselines on it every twelve hours since launch, as per protocol."

"And?"

"Two of the isotopes are — missing isn't the right word. Their counts are low. Significantly low, compared to our pre-launch baseline."

Reed's pencil stopped tapping. "Which two?"

"Potassium-40 and thorium-232. The long-half-life ones."

"How low?"

"Call it five percent under. On a sample that should decay by roughly nothing, over a week, within our instrument's precision. I re-ran the counter with a different crystal. Same result. I ran the cocktail through a third system. Same result."

"Are you sure it isn't the detector?"

"I'm sure it isn't the detector."

"What about the sample?"

A silence on the line, which on the line was a two-

second silence plus a round-trip radio lag.

"The sample shouldn't change, Evelyn," Jones said, gently, the way one said things to a colleague whose question one was forgiving. "That's the point of a reference cocktail. It should be the same isotopes in the same ratios for the next hundred thousand years, within measurement noise. It's not the sample. Unless the sample has somehow — decayed faster than it should have. Which isotopes don't do."

"No," Reed said. "They don't."

"So either I've got two independent instrument failures that happen to produce the same lie, or I've got a couple of fewer atoms of potassium-40 in a test tube than I brought up here. I thought you'd want to know."

Reed looked up at Thorne, across the console. He could see her weighing a sentence on her tongue.

"Run it again in six hours, Dr. Jones," she said instead. "And send me everything."

"Copy, Houston."

She turned fully to Thorne when the mic was off. Her face had not moved, but something behind it had. "Aris," she said — she only called him Aris in small rooms — "I don't like two small things at the same time."

"It's a big ship," Thorne said, which was meant

to be reassurance and which came out, to his own ear, sounding like evasion. "Two small anomalies on a crewed mission of this size is, statistically, a quiet day."

"Related small anomalies, Aris."

He paused. "Are they related?"

"I don't know. That's what I don't like."

He looked at the main screen. The Ares I was a small green dot on a long curved line, well past lunar orbit now, accelerating at a rate so gentle that a cup of water on a galley shelf up there would not have noticed. Inside that dot, four people were, presumably, eating freeze-dried risotto and running detectors and complaining about the coffee and, in Rostova's case, writing her daily log in the green pocket notebook she had carried on three prior missions because she did not trust anything with a battery to preserve her thoughts.

"Keep me posted," he said again.

"Precisely," Reed said again, this time without warmth, because she had moved through the part of the conversation where warmth was available and was now working.

It happened on day six, at 14:42:11 Houston time,

during a routine check-in.

Thorne was not in the room. He was in the corridor, because he had walked out two minutes earlier to take a phone call from his daughter, who had remembered — or been reminded by his ex-wife, which was the more likely of the two — to call him after the TLI burn with congratulations. The call was brief. His daughter was twenty-four and lived in Copenhagen and had her own work. She said *Dad, that's amazing, you must be so proud*, and he said *thank you, yes, I am*, and for some reason neither of them said anything else, and after a minute of listening to each other not say anything they both laughed, a little, at the same time, and she said *okay, I'll let you go*, and he said *yes, all right*, and the call ended.

He was still standing in the corridor with the phone in his hand when the door banged open.

"Aris."

It was Reed. She did not bang doors.

"What."

"Come."

He came. He was following her down the corridor before he had put the phone in his pocket, and by the time he walked through the door into Mission Control the room had already gone quiet in the very particular way a room goes quiet when something un-

speakable has happened in it and no one yet has the authority to name it.

Nobody was speaking. The console operators were at their stations. A few had their hands over their mouths. Vikram was standing, which he did not do. On the main screen the trajectory plot was unchanged. On the telemetry panel, every indicator was green.

Every indicator was green.

"What happened," Thorne said.

"Play it back," Vikram said to somebody, and somebody played it back.

Through the ceiling speakers came Rostova's voice, mid-report, in the middle of the sentence she had been speaking six minutes earlier.

"— and Jones wants to rerun the calibration once more this evening with a fresh cocktail, which I've approved, pending —"

The sentence stopped.

It did not trail off. It did not cut. It stopped, the way a word stops when the mouth that is making it stops being in the room.

Silence on the downlink. Not the ragged silence of a dropped connection — the silence of a live channel with nothing in it. The clean small hiss of the carrier wave, undisturbed.

"Ares I, Houston," said the CAPCOM, who had been a child during the Columbia disaster and who had trained for this eventuality for nine years and who now spoke the sentence exactly the way the manual said to speak it. "Ares I, Houston. Do you read?"

Nothing.

"Ares I, Houston. Do you read? Over."

Nothing.

"Run it again," Vikram said.

They ran it again. — *pending* — Stop. Hiss.

"Run it again with the telemetry overlaid."

They ran it again with the telemetry overlaid. Thorne watched the numbers on the biometric panel: Rostova's pulse, 64 — 64 — 64 — and then, between one frame and the next, a reading the system did not have a color for, because the system had been designed to flag dangerously high or dangerously low heart rates, not to flag their absence. The number simply stopped updating. The number on the panel, at T+14:42:11, read 64. At T+14:42:12, it read nothing.

It read nothing for the next several seconds, and then, in the patient way of a system that had been told its sensors were intact, it filled in a zero.

Four zeros.

Four zeros held steady in four neat rows on the biometric panel. Rostova, Tanaka, Hanson, Jones. Pulse zero. Respiration zero. Temperature — and here the panel did something Thorne had never seen a panel do, because the engineers who had built it had not anticipated needing to display this — temperature dropping at the rate the suit sensors could update, which was once per second, toward ambient.

“Medical,” Vikram said.

“I see it,” said the flight surgeon, whose name was Patel, whose face had gone the color of paper. “I see it. I don’t — I don’t have a — there’s no event. There’s no event on the medical telemetry. They didn’t decompress. They didn’t — there’s no cardiac spike. There’s no anything. They —”

“Are you saying they flatlined.”

“I’m saying they didn’t *do* anything. They’re just — not —”

He stopped. He started again. “The biometrics went to zero between one sample and the next. All four. All four simultaneously. There is no medical event I know of that does that.”

Thorne stared at the numbers. He stared at them for a length of time he was not able, later, to estimate, because the thing his mind was doing during that in-

terval was not the kind of thing minds do in measurable time. It was not disbelief. Disbelief would have been a mercy. It was something slower — the patient sequential checking of each of the mental structures on which he had been standing for thirty years, the confirmation that each structure was still there, and the confirmation, underneath that, that the structures did not contain the shape of what he was looking at.

"The ship," he said.

Vikram did not answer, because the question had not been a question.

"The ship," Thorne said again, "is still burning."

"Yes," Vikram said.

"The ion drive is active."

"Yes."

"The trajectory is nominal."

"Yes."

"The autopilot is running the programmed mission."

"Yes."

"The programmed mission is Mars."

A silence.

"Yes, Dr. Thorne."

Thorne reached behind him without looking and found the back of a chair and put his hand on it. He did not sit down. He was not, not yet, a man who sat

down.

"The ship," he said, very carefully, as if laying out a problem for a student, "is on its way to Mars, and the crew is —"

He did not finish the sentence, because nobody in the room had the word it wanted. *Dead* was a word that required an event. *Dead* was a word that required a body with something wrong with it. The word for what was happening on the telemetry panel, insofar as the telemetry panel was to be trusted, was a word for a situation in which four human beings had, between one second and the next, ceased to register as human beings. No decompression. No heart attack. No radiation event, no failure of the life-support systems, no meteoroid strike, no — and this was the part that, he would realize later, had begun eroding the floor of the world for him from the first moment — no *cause*. The numbers did not say *they died*. The numbers said *they stopped*.

And the ship did not stop.

"Get me cameras," he said. "Interior."

"Cameras are up. We have feed from all three galley cams, the cockpit, and the lab."

"Show me."

They showed him.

He stood at the console. He did not reach for it, be-

cause his hand, once more, had begun to shake, and because he did not want to be seen reaching for it. On the five small screens that blinked up in sequence, the interior of the Ares I was perfectly lit, perfectly quiet, and perfectly ordinary. The galley clock read the correct time. A clipboard floated, tethered, beside a handheld. On the cockpit screen, Tanaka was in his seat, his hands resting loosely on the armrests, his face turned slightly to the left, as if he had been looking at something on the copilot's panel and had been caught in a photograph. Rostova, at the mission commander's station behind him, held her small green notebook in one hand and a pen in the other. The pen was still capped. The notebook was open to a clean page. Her head was tilted very slightly down, toward the page, in the attitude of someone mid-thought.

On the lab camera, Hanson sat at her console with both hands resting on the keyboard, her fingers on the home row. Jones was not visible at first. The operator panned. He was at the secondary bench, in the middle of reaching for a rack of vials. His hand was outstretched. His face was not turned toward the camera.

Nobody was moving.

This was not, Thorne told himself, in itself strange. People sat still. People held poses. One