

Alien Graveyard: Europa

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Prologue

SOTA

At half a million feet beneath Europa's south polar ice, the ocean had no color, and Sota Nakamura preferred it that way. Color distracted the eye. Darkness reduced the world to what mattered: instruments, terrain, chemistry, pressure. His submersible's lamps carved two pale tunnels through the water, illuminating a steep hydrothermal ridge rising from the abyss in broken terraces. Black mineral chimneys leaned over the slope like ruined towers, and between them weak currents lifted translucent sheets from the sediment, thin as shed skin, then let them settle again in slow folds.

Sota eased the sub forward. “On station,” the autopilot answered with a soft tone, thrusters pulsing once before going quiet. He leaned toward the forward display. A pale sediment layer protruded beneath a crust of iron sulfides, almost invisible except where his earlier excavation had exposed it. He had spent nine days working this ridge, moving no faster than a few meters an hour. Some called that obsessive. Sota called it science.

He extended the starboard manipulator and brushed sediment from the seam. The translucent material peeled back, exposing a band of dark grains and metallic flecks. His pulse quickened. “Sample site 27. Depth 150,400 meters. Layer thickness approximately six centimeters.” The manipulator clipped away a fragment and transferred it into the external analysis chamber. Numbers populated the screen: nickel, cobalt, platinum-group elements. Expected. Then the spectrometer recalibrated, and Sota frowned. “Platinum-group metal anomaly confirmed.”

A second reading appeared, then a third. The concentrations were absurd, far above anything in the surrounding European crust—or, for that matter, anything known in the Sol system. Stranger still were trace elements he had found nowhere else on the ridge, bound in ratios that refused to match known meteorites, hydrothermal deposits, or human contaminants.

Extrasolar?

The possibility seemed ridiculous. Yet the isotope ratios bothered him more than the concentrations. If the instruments were right, some of this material might not have formed anywhere in the Sol system.

Then there was the organic matter. Sota magnified the chamber image. Tiny cellular forms clung to the mineral grains in dense colonies, their chemistry unmistakably European. But embedded among them were darker fragments—microscopic membranes, branching structures, and carbon-rich residues preserved within the mineralized layers. Some resembled the remains of cells. Others had no structure he recognized at all. The whole deposit had a fantastical beauty, part mineral formation, part fossil bed, part something he had no name for.

“Beautiful,” he whispered.

He had stopped using that word years ago. Beauty did not survive budgets, patents, contracts, and corporate lawyers, but these things were beautiful. And valuable. That thought tightened something in his stomach because the first cultures had already left Europa—carefully, quietly, through intermediaries who never knew where they came from. Cutten had paid more than Sota expected and asked fewer questions than he liked. At first that had seemed ideal. Recently it felt different.

Someone had accessed one of his dead accounts, then another. Three days ago, an encrypted inquiry arrived through a broker using details only the final buyer should have known: sample origin, depth, collection coordinates. Sota deleted it. Yesterday the broker vanished from the network. Cutten knew. Maybe not everything, but enough.

A tone sounded, and Sota looked at the communications display. The pulse again. Three seconds, silence, three seconds, silence. He had detected it twice during the past week, always weak, always somewhere beyond the ridge. He had assumed interference from Europa's magnetosphere or perhaps reflections from one of the old survey transponders embedded in the ice. This time the signal was stronger. Sota rotated the sub ten degrees and watched the bearing shift across the hydrophone display. Whatever was producing the pulse lay somewhere ahead and below him, deeper along the ridge. Someone was down here.

Sota straightened. There shouldn't be a signal. There shouldn't be anyone here at all. He was alone on Europa. No research crews on the surface, no prospectors beneath the ice, no human ships in orbit. He had checked the traffic logs before leaving Cassini and again before beginning his descent. That isolation was one reason he had chosen the south-polar fracture. No witnesses. No competitors. No one to ask what he was bringing back.

Yet the pulse was coming from somewhere near him, deep in the ocean.

Very deep. He checked the receiver diagnostics. Signal integrity normal. No harmonic bleed from the sub's systems, no obvious reflection from his own equipment. He rotated the hydrophone array a few degrees. The bearing held steady while the array moved around it. The pulse had a fixed source.

His unease sharpened into suspicion. Cutten had the ships, money, and reach to mount an operation without announcing it. If they had traced the samples back to him, they might have followed him from Cassini—or arrived before him and waited. His jaw tightened. *Cutten.*

“Passive sensors only.”

The external lamps dimmed, and darkness swallowed the ridge. He killed active sonar and watched the hydrophone trace. Pulse. Three seconds. Pulse. Stronger now.

Sota brought propulsion online but kept thrust minimal. The navigation computer projected his return path to his ship on the surface: upslope along the ridge, a long ascent, northwest to the fracture, then twelve kilometers through the ice. If Cutten had somehow followed him down here, he wasn't going to lead them to his main excavation.

He turned the sub in the opposite direction. Downslope.

The ocean opened into blackness. For several seconds there was nothing, then a shape appeared at the edge of his dim lights. Sota leaned forward, initially taking it for part of the ridge. But it was too smooth. Too large. Then the darkness moved, and something immense separated itself from the abyss. His breath stopped.

It wasn't a submarine. Not any submarine he knew. Its outline was asymmetrical, a black mass of armored lobes and skeletal projections, its surfaces broken by structures that looked less manufactured than accumulated. No navigation lights. No hull markings. No recognizable propulsion. Sota's hand hovered over the controls. “What the hell are you?”

Whummm. Whummm. Whummm.

The pulse rolled through the hull again, and Sota glanced at the hydrophone display. The bearing hadn't changed. His eyes returned to the black shape. The signal wasn't coming from it: something else was out there.

He opened a broad emergency channel. “Unidentified vessel, this is civilian exploration craft Seven-Nine. You are approaching a private survey operation. Identify yourself.”

Nothing. He repeated the message, watching the black shape hovering beyond his lights. Still nothing. Then the dark machine moved. Fast.

Sota slammed the thrusters forward. The impact came from starboard with a shriek of tortured metal, snapping him sideways against his harness while alarms erupted across the cabin.

THRUSTER THREE FAILURE.

EXTERNAL DAMAGE.

PRESSURE HULL NOMINAL.

He killed the alarms and twisted the sub toward the ridge, his breathing suddenly loud in the silence. The other craft had disappeared beyond the lights. "Full thrust." His damaged vessel responded sluggishly as a red indicator flashed across the communications panel.

COMMUNICATION LINK: UNAVAILABLE.

Of course. The relay he had planted in the access fracture had failed days ago when the ice shifted, crushing it or sealing it behind kilometers of moving ice. He had planned to replace it after one more sampling run. One more. He almost laughed. Then a shadow crossed above him.

Sota rolled hard beneath an overhanging smoking chimney. "Come on."

The black craft followed, close enough now for his lights to rake across jagged plating, curved structural ribs, and surfaces scarred and mineralized as if the vessel had been underwater for years.

A violent blow struck the stern. The cabin snapped sideways, and something burst behind him, spraying cold mist across the instruments. The pressure alarm changed pitch. Sota froze as a hairline crack appeared across the starboard pressure panel, then another beside it. Water beaded through the seam. At this depth, the ocean did not need a hole. It needed a weakness.

"Emergency ascent."

The sub tried, but one thruster spun uselessly. The black machine drifted into view beyond the viewport, close enough now to fill the glass. For the first time Sota saw it clearly: layered armor, mismatched structures, surfaces that seemed

ancient beneath their mineral crusts. Nothing about it was human. Nothing about it looked new.

His recorder light blinked steadily beside the console. Sota stared at it, then at the impossible machine beyond the glass. “If anyone finds this, I found something beneath the ridge. Something that doesn’t belong here.” The hull groaned, and the viewport flexed inward. “The deposits, the signal, this vessel—they’re connected somehow.” He swallowed, watching another fracture race across the pressure panel. “And this isn’t Cutten.”

A sharp crack split the cabin. Sota had time for one final breath. Then Europa came in.



Chapter 1

BENEATH THE ICE

Cassini Station rotated slowly above Saturn, its outer rings catching reflected light from the planet until the entire structure seemed suspended inside a pale gold haze. Orion Anderson barely noticed. He stood at the viewport in Tasman Biotech's temporary berth, watching traffic crawl between the station and the wormhole platforms while a message from Earth replayed on the wall behind him.

"My brother doesn't disappear."

The woman speaking looked exhausted. Mid-fifties, perhaps, although grief made age difficult to judge. Her name was Emi Nakamura, and Orion had never

met her. She had contacted him because his name appeared repeatedly in Sota's old correspondence from Ceres.

"He goes weeks without talking to us sometimes," she continued, "but he always sends something. A text. A picture. Usually something sarcastic about how worried we are." She attempted a smile that vanished almost immediately. "Nothing for twenty-three days. His accounts haven't moved. He missed our mother's birthday. Sota would not do that."

Orion folded his arms. "When did you last speak with him?"

"September eighth. He was excited about something, but he wouldn't tell me what. He said he'd found his retirement."

Orion knew what Sota meant by retirement. A single organism with the right biochemical properties could finance decades of exploration, and Europa offered an entire ocean of possibilities. Tasman Biotech had survived too many years on contracts that barely covered its expenses. The *Pilbara* needed maintenance, the *Volans* needed upgrades, and every expedition began with another argument over money. Whatever Sota had discovered might change all of that.

He glanced at Emi's exhausted face on the screen and disliked the direction of his thoughts. Her brother had vanished, perhaps died, and Orion was already calculating what his discovery might be worth. Yet the calculation persisted. If Sota could be found, Orion would bring him home. If he could not, there might still be something on Europa worth recovering.

Orion looked away from the recording and stared through the viewport. Saturn filled half the sky, bands of ocher and cream disappearing behind the station's superstructure. Far beyond the visible curve lay Enceladus, and much farther out, Jupiter, and Europa. Sota had always preferred places like those—cold, inaccessible, expensive enough to discourage competition.

He touched the screen and paused the message.

Luciana, their Chilean molecular biologist and geneticist, sat at the small lab console behind him, elbows resting beside an open case of sequencing cartridges. "Twenty-three days is a long time."

"Aye."

“You think he’s dead?”

Orion didn’t answer.

Kairo, the Swiss engineer who kept the *Pilbara* and nearly everything aboard her working, swiveled around from the navigation station. “His flight plan ended at Europa?”

“That’s what his sister says.”

“Europa.” Kairo rubbed a hand through his thick brown hair. “*Merde*.”

Orion gave him a sideways look. “Problem?”

“Several.”

“Pick one.”

“Nobody is there.”

That caught Luciana’s attention.

Kairo enlarged a system traffic map. Europa appeared as a small white sphere orbiting Jupiter, surrounded by nothing except navigation markers and old scientific beacons. “No permanent base. No current survey teams. No prospecting licenses. Nothing registered in orbit. Sota went alone.”

“That’s his style.”

“His style is suicidal.”

Orion almost smiled. “Sometimes.”

He knew Sota Nakamura better than he liked to admit. They had first crossed paths on Ceres during the early microbial rush, when every drill core in the Cerealia bright spot seemed capable of producing either a scientific paper or a patent worth millions. Sota had accused Orion of contaminating a brine sample. Orion had accused Sota of stealing his drilling coordinates. Both accusations had probably contained some truth. Six months later, when a pressure failure trapped two technicians beneath a collapsed extraction shaft, Sota had crawled through a conduit barely wide enough for his shoulders and dragged one of them out himself.

Afterward, bruised and bleeding, he had complained that the rescue had ruined a perfectly good sampling day. Arrogant but brilliant. And Orion understood him. That was probably why the silence bothered him.

Luciana brought Emi's message back onto the display. "Did he say what he was doing on Europa?"

"Bioprospecting."

"That means nothing."

"It means he didn't want anyone knowing."

She frowned. "Including us."

"Especially us."

Sota and Orion occupied the same narrow ecosystem: independent operators hunting microbial chemistry before the major corporations could lock down a site. They competed for contracts, patents, drilling access, transport slots, even graduate recruits. Neither trusted the other, but both respected competence, and respect was worth more to Orion than friendship.

He restarted the message.

Emi drew closer to her camera. "Mr. Anderson, I know you and Sota competed. He talked about you all the time, usually while complaining." A faint smile returned. "But he respected you. He said you were one of the few people crazy enough to understand why he went out there."

Orion felt something shift beneath his ribs as he shut off the recording. For several seconds, only the ventilation fans disturbed the room.

Luciana studied him. "Don't."

"Don't what?"

"Make that face."

"What face?"

"The one you make right before something becomes our problem."

Kairo laughed quietly.

Orion turned from the viewport. "Pull everything we have on Sota's movements."

Luciana sighed. "There it is."

"I didn't say we're going anywhere."

"No. You just started giving orders."

He ignored her and walked to Kairo's console. "Last confirmed departure?"

Kairo enlarged the Jovian system. "Sota departed Cassini forty-six days ago. Last confirmed fix put his ship entering Europa orbit nineteen days later. I can't find any record of it leaving."

Orion leaned closer. Sota would have left the ship in orbit when he descended beneath the ice. If it was still there after three weeks, he had gone down and never come back.

"Anyone else enter Europa orbit?"

"No way to know. There's no local traffic control. I can search Jovian traffic, but anyone trying to stay invisible could."

"Cutten?"

Kairo shrugged. "Or anyone else with a reason."

Orion stared at the small white moon. "Search everything that entered Jovian space around the same time. Corporate, private, government. Anything that doesn't fit."

Luciana folded her arms. "You think somebody followed him?"

"I think Sota left a perfectly good ship orbiting Europa and never returned to it."

"Orion, Europa isn't Ceres," Luciana said emphatically. "If he went under the ice, we can't just fly down and knock on the door."

"I know."

"Do you?"

He looked at her.

She pointed toward the hangar through the bulkhead as if she could see through it. "The *Volans* hasn't finished deep certification."

"It passed pressure testing."

"In a tank."

"Pressure is pressure."

"No, it isn't, and you know that." Her voice sharpened. "A test chamber doesn't have ice collapsing around you, currents, mineral debris, thermal gradients or anything else Europa decides to throw at the hull."

Kairo lifted both hands. "For once, I agree completely with Luciana."

She glared at him. "For once?"

Kairo continued before she could answer. "Look, the *Volans* is designed for Thalassa. That's the mission. That's why you spent a fortune building her. Do you really want to risk her on a rescue mission to one of our competitors?"

Orion's eyes drifted instinctively toward the hangar.

The *Volans* had consumed three years of design work and an obscene percentage of his personal capital. Sleek, compact, and amphibious, she could descend from orbit, enter an alien ocean, and operate at pressures far beyond the reach of conventional submersibles. No one else had anything quite like her. She existed for one reason: Thalassa.

His father's world. Gary Anderson had disappeared there eighteen years ago with the *Proteus IX*, and Orion had spent most of his adult life preparing to return. Every profitable microbe, every patent, every miserable year drilling frozen rock on Mars and Ceres had brought him closer. When Thalassa reopened, the *Volans* would carry him into the ocean his father had never come home from. Risking her on Europa before that mission was madness and he knew it.

"What depth?" Orion asked.

Kairo hesitated.

"Sota's target. What depth?"

"I found fragments of his earlier survey work. He was interested in a volcanic ridge near the south pole." Kairo pulled up a crude bathymetric reconstruction. Europa's thick ice shell appeared above an enormous dark ocean, the estimated seafloor traced in uncertain contours. "If this position is right, the ridge crest is around 151 kilometers below the underside of the ice."

Luciana stared at him. "One-hundred and fifty-one kilometers?"

"Almost five hundred thousand feet," Kairo said. "Ninety-five miles."

Her head snapped toward Orion. "Under the ice?"

The *Volans's* certified operational limit sat far above that.

Kairo tapped another figure onto the display. "Her design margin gives us some room beyond certification, but not that much. If Sota went to the bottom here, he was using a specialized abyssal vehicle."

“He built his own,” Orion said.

“Of course he did.”

Luciana crossed her arms. “And apparently it didn’t bring him back.”

The words settled heavily between them.

Orion returned to the viewport. Cassini’s lights reflected faintly across the glass, superimposed over Saturn. Somewhere behind that enormous planet and millions of kilometers of darkness, Sota might be sitting inside a disabled submersible, rationing oxygen and waiting for someone who did not know he was alive. Or, more likely, he might already be dead. Orion wished the possibilities felt different.

A memory floated up: Tasmania, cold dawn, his father’s hand resting on his shoulder as waves broke against cliffs far below. “Helping others selflessly, without expecting anything in return, is a powerful way to earn honor.”

Orion clenched his jaw.

He hated when his father’s voice surfaced at moments like this. His father had been dead nearly two decades and still managed to interfere with perfectly rational decisions.

This wasn’t about honor. Sota possessed equipment, samples, data. If he had made a significant discovery, someone needed to recover it before it vanished beneath Europa’s ice. That was practical. Commercially sensible, even. And if Sota happened to still be alive, they would bring him back too. If they could.

Orion turned toward his crew. “How soon can the *Pilbara* depart?”

Luciana stared at him. “You’re serious.”

“Kairo?”

The engineer looked between them, realized the decision had already been made, and sighed. “If we load fuel here, six hours. Maybe five.”

“Make it four.”

Luciana stepped directly into Orion’s path. “You just said the *Volans* isn’t certified for his depth.”

“I heard you.”

“You built that ship for *Thalassa*.”

"I built her to explore alien oceans."

"You built her for your father."

That landed hard. Orion felt his shoulders tighten, the old defensive wall rising almost automatically. "Leave him out of this."

Luciana held his gaze. "Then don't risk everything you've worked for because one reckless bioprospector stopped answering his messages."

"He's not one reckless bioprospector."

"Then what is he?"

Orion opened his mouth and stopped. Competitor was easy. Rival was easier. Pain in the ass came closest. But none explained why Emi Nakamura's face remained in his mind.

"He's ours," Orion finally said. "One of the fools who goes out there before it's safe because somebody has to find out what's there."

Kairo gave him a thin smile. "That may be the closest thing to affection I've ever heard from you."

"Don't get used to it."

Orion brought up the Jovian system and expanded Europa until the fractured moon filled the display. White ice, brown scars, chaos terrain, the faint outline of the south polar region. Somewhere beneath that frozen shell lay an ocean deeper than any sea on Earth, and somewhere in that ocean Sota Nakamura had disappeared.

He pointed at the moon. "Get the ship ready."

Luciana exhaled slowly. "And the *Volans*?"

Orion looked toward the hangar again. Three years of work. His money. His father's dream. The one machine he could not replace before Thalassa reopened. For the first time since Emi's message arrived, he felt genuine hesitation. Then he remembered Sota crawling into that collapsed shaft on Ceres while everyone else calculated the odds.

"Load her."

Neither Luciana nor Kairo argued again.

Orion watched Europa rotate on the display, a small white world hiding a massive black ocean beneath miles of ice. He told himself they were going because Sota's research might be valuable, because abandoning proprietary data would be wasteful, because an independent operator disappearing without investigation was bad for everyone in their business.

All of that was true. But none of it was the reason he had just put the *Volans* at risk.