

Through Struggle, the Stars

A Human Reach Novel

John J. Lumpkin

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To Alice
Who Gave Me the Time to Try

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Details on the setting are available at
<http://www.thehumanreach.net>.

“Sooner or later disasters such as an asteroid collision or a nuclear war could wipe us all out. But once we spread out into space and establish independent colonies, our future should be safe.”

— Stephen Hawking, to the British Broadcasting Corp.,
November 30, 2006

“The key lesson of the last two centuries is that humanity could indeed be wiped off the face of the Earth, with no appeal, no mercy, no reprieve. We learned it as we burned away our resources beyond our capacity to replace them. We learned it from the nuclear fires in Delhi and Grozny. We learned it when the Rock hit.

“Just what did we learn? That humanity must leave its cradle and spread to the stars to ensure its survival and prosperity. We had work to do, to build the bridges to new worlds, but the reward, colonies like this one, has made us safer.

“Now America’s children are on several planets, so an even bigger Rock will not wipe us out in a single stroke. We are safer, but not totally safe, for we humans remain a danger to ourselves.”

— Patrick Gonzales, United States Secretary of Colonial Affairs, inaugurating Liberty colony, August 4, 2137

Prologue

The *Bluegrass Cat* was a modular container hauler, a design that had barely changed in fifty years – a control deck and living quarters at the top and a fusion candle at the tail, connected by a long shaft, which mounted dozens of cargo pods, some of them rotating slowly around the ship's axis. She was long, thin and ugly: a freight train in space.

Her cargo to Zhuxing, the Chinese colony world orbiting Zeta Doradus, had been precision tools manufactured only on Earth, and she was departing with a load of Zhuxing's native version of blue-green algae. This particular species was neither blue-green nor algae, but the microbes, reddish under a microscope, played a similar ecological role. They were one of the most efficient natural photosynthesizers yet discovered, and, without them, Zhuxing would have been an uninhabitable wet rock. They would fetch a high dollar on some of the colony worlds where oxygen was wanting.

On this run the *Cat* carried a second cargo, two bored American intelligence officers who had spent the last sixteen days monitoring government communications on Zhuxing while the ship sat moored at an orbital freight terminal.

The *Cat's* American owners, sympathetic to Washington's interests, provided free, no-questions-asked transit to government agents on some of its vessels. It was a secret arrangement, and a good one for both sides; U.S. intelligence agencies could quietly move around their people to foreign planets without setting up cumbersome front companies or relying on passenger liners, and the shipping line found itself deliciously free of certain regulatory pressures that its competitors faced.

4 John J. Lumpkin

The officers had been picked up from their station on Guoxing, an older Chinese world, three systems upstream toward Earth, and their time over Zhuxing had coincided with a visit to the surface by the Chinese premier. They came away with vast stores of intercepted communications related to his stay. The senior officer, a veteran spook named Donovan, was fluent in Mandarin, and he had gone through what seemed the most promising intercepts, but he had so far come up with mostly dry bureaucratic messages that didn't interest him in the least. The most compelling, in his opinion, was an unedited news recording of the premier giving a fiery speech in a hotel ballroom on the dangers of Japanese aggression. Its vehemence was exceptional; China and Japan, Earth's top two powers by most measures, were locked in a cold war, but it was unusual to hear such a high-level official indulging in what could be only regarded as racist remarks.

The remaining intercepts would be for Earthside computers to decode and analyze in hopes of finding some useful tidbit that would provide the State or Defense or Colonial Affairs department some advantage, somewhere, somehow.

Only the officers had to get it home. Transmitting this much bulk data from a mere freighter through the wormhole communications relays back to Earth had some chance of attracting the Chinese government's attention. The network of artificial wormholes that allowed ships easy travel between the stars also served as the sole communications conduit between them. Buoys on either side of the wormholes received and transmitted vast amounts of information: News, sports scores, love letters and coded government transmissions all had to pass through them. While a starship would take months to traverse the expanding sphere of worlds accessed by the wormhole network, a message could

cross it usually in less than a day, bouncing from one buoy to the next at the speed of light. But most buoys had government taps, monitored by software ostensibly looking for threats to national security. Zhuxing was several systems downstream from Earth, and all the buoys in between were under the authority of the government in Beijing. And without the chain of wormhole relays, transmitting a message home from Zhuxing through empty space would require a wait of 38 years.

So the data had to be hand-carried, and now the microbe-laden *Bluegrass Cat* was among a half-dozen ships waiting in line outside the Zeta Doradus wormhole, located in the leading Trojan point of the planet's second moon. This was the wormhole that initially opened the system to colonization and ultimately led back to Earth. The other two wormholes in the system led to stars further out, where China hunted still more colony worlds for its cramped millions.

In the *Cat's* stateroom, the junior of the two intelligence officers, Rafe Sato, reflected that he would never get back the last six weeks, or the twelve more it would take to return to Earth. Rafe, whose roots were part Hispanic, part Japanese and all Californian, had known there would be drudgery on the job; stealing secrets was not as dramatic as the movies would have the masses believe. He'd spent most of the trip out on his computer, taking some refresher courses to keep his technical certifications up to date. After they orbited Zhuxing, Rafe's chief role was to handle the comm intercept gear while Donovan told him where to listen.

But, damn, this mission had been especially dull.

Rafe and Donovan's agency had no permanent presence on Zhuxing, and the American cultural mission was all of two people, both surely followed round-the-clock by Chinese security. Nor had the agency had any luck obtaining

6 John J. Lumpkin

permission for one its front companies to operate on the planet.

That leaves it to us, thought Rafe, wondering why this Han bigwig was worth following.

On the upside, the Hans had been overconfident about their security; the premier and his staff transmitted most of their messages to orbit via microwave rather than laser. Laser comms were almost impossible to intercept without hacking into a communications satellite.

And Rafe Sato had done just that, for all the good it did. *What's the use of a good hack if all you get out of it is garbage?*

Donovan tapped a button on his handheld and inclined his head toward Rafe.

"Did you read this?" he asked. Rhetorical; he was reading text projected on the inside of his eye.

"Read what?" Rafe asked.

"The Japanese are going to settle around Xi Pegasi after all."

It rang a very small bell. "Xi Pegasi?"

"It's an old star that's going subgiant," Donovan said. "They found a marginally habitable planet there. It must have been almost covered with ice until a few hundred thousand years ago, just at the far edge of the star's habitable zone. Another microbial-life-only planet, like Zhuxing. Now the star is getting bigger, and warmer, and the ice is melting, and the Japanese are going to colonize it."

"That's what, the Sakis' sixth planet? How many do they need?" Counting colony planets was at the heart of nationalism these days. After Japan, China had five and Europe had four. The United States had three, plus an Australia-sized continent on one of the Chinese worlds.

"That's not the point. The planet is going to boil in a few thousand years as the sun keeps getting brighter," Donovan said. "Not a very good place for a colony."

Rafe thought it over briefly. "Recorded history is a few thousand years."

"It's still rank foolishness. That's such a short window in the lifespan of a species. Someday, millions will die there if they can't evacuate them all."

Donovan was a decent boss, but he liked to argue for the sport of it, and Rafe wasn't in the mood to engage him right now.

"Well, I imagine they'll figure something out long after we're dead and gone," Rafe said. "But if it will make you happy, I promise you I won't settle there."

Donovan chuckled. "Fair enough."

"What are they going to call the planet?"

"Hinomaru. A rather nationalistic break for them, don't you think?"

Most of the other Japanese worlds had more bucolic names. Hinomaru was the rising red sun on a white field, the Japanese flag.

"Sure," Rafe said. *Humor the boss.*

Donovan kept at it. "I tell you, this rush for —"

He was interrupted by the voice of the *Cat's* captain on the ship's intercom:

"We just got put on indefinite hold by traffic control. Don't know why."

This was unusual, and Rafe swore to himself — as if the trip home wasn't long enough already. He switched his handheld to monitor one of the *Cat's* external cameras, sending its images to his ocular implant. The first camera was pointed at Zhuxing; his vision filled with a startling, beautiful picture of blue oceans, white swirls of clouds, and a great rust-colored equatorial continent, with a patch of green and brown reaching inland from its western coast.

He hit a button, flicked through three views of nothing but fields of stars, until he found the camera pointed at the

8 John J. Lumpkin

wormhole. He made out the guidance rings, an idle robotic ballast tug, and the thin disc of the wormhole itself. He transmitted the image to Donovan.

There. A small Chinese warship, some kind of corvette, emerged. It had scorches on its hull, and a long rent along one side. Several sections opened to space.

“Ouch,” Donovan said.

The ship did a quick pivot, almost as if it was looking over its shoulder. After a few minutes, it went back through the wormhole, apparently satisfied the formation of waiting freighters posed no threat.

Rafe started to speak, but Donovan shushed him.

A big warship came through. Had to be 20,000 tons. A Chinese flagship.

It too had taken a beating. Its nose was smashed inward; it bore scorches and pitted areas, and one of its main gun batteries was wrecked. Three more warships followed the battleship, two of them also showing significant damage.

“Let’s get out a flash message,” Donovan said to Rafe. “Then call up Jane’s and try to identify those craft.” Neither he nor Rafe recognized the ships; they were civilian intelligence officers, not military.

“There must have been some kind of battle,” Rafe said. He typed a brief message into his handheld.

EYEBALLED CHINESE PLA STAR NAVY FLEET ENTERING ZETA DORADUS FROM GJ 2036 KEYHOLE. SEVERAL VESSELS HAVE SUSTAINED SIGNIFICANT BATTLE DAMAGE FROM UNKNOWN ENGAGEMENT. DESCRIPTION OF SHIPS TO FOLLOW.

Rafe hit the send key. Inside his eye, text scrolled: ENCODING ... TRANSMITTING ... DESTINATION NETWORK REPORTS ALL OUTGOING MESSAGES WILL BE MONITORED AND APPROVED FOR TRANSMISSION. DO YOU STILL WISH TO SEND?

He swore and typed in "NO." He turned to Donovan. "They already shut down the comm buoy to unmonitored message traffic. We'll have to carry this one home too."

He was right. With a human reading every message going through the buoy, they were risking notice even by sending a short, coded message. And their hidden-in-plain-sight cipher was limited to emergency political reportage: It wasn't robust enough to encode a report on a military action within a bland message to the company's headquarters about the freighter's movements. The best Rafe could manage – "Important China Japan conflict" – would probably just cause confusion, but he sent it anyway, reasoning it was better to be accused of ambiguity than inaction. To tell the real story, they would have to wait until the *Bluegrass Cat* reached the Solar System in twelve weeks before they could transmit.

Two more ships came through the wormhole. The first was undamaged and had no visible weaponry – a fleet tender, probably. The second, however, was not Chinese in manufacture; it lacked the distinctive forward sphere that dominated Chinese military starship design. Rafe commanded the ship's camera to follow it as it passed by the *Cat*. It was a long dart of a warship, also badly damaged.

Donovan's eyes narrowed as the ship's side was illuminated by Zeta Doradus. He saw a white field with a red circle, with rays extending in all directions.

Hinomaru. The rising sun.

Donovan touched some buttons on his handheld, activating the comm implant in his head. "Captain, what's the transponder from the last ship through say?"

A pause. "It's coming through as Chinese Star Navy," said the captain, his voice full of queries he didn't have the guts to ask. Donovan cut the connection with him. The camera feed went out; the Chinese authorities had ordered

10 John J. Lumpkin

all the waiting vessels to shut their eyes. It didn't matter; he could put together what happened. The cold war between Japan and China had warmed up significantly. The Japanese warship was a Chinese prize.

Book I: Outbound
Earth-Entente-Commonwealth

Chapter 1

Neil Mercer couldn't decide if he was holding his wine glass correctly. A furtive scan of the reception guests left him with several options – hand underneath the bulb, or around the top, or three fingers and thumb on the stem – the last adopted by the two people next to him, who were having their glasses filled at the bar.

He decided to imitate the guest of honor, Antonio Larkin, a rear admiral who had come out to Boulder for this morning's graduation and commissioning ceremony for Neil and two dozen of his fellow ROTC cadets. Neil cupped the bottom of the bulb of his glass with his right hand.

I can make a lot of mistakes in here, he thought, despite the amiable chatter around him. He picked up a soft-looking pastry from a passing tray and wondered what the red wine was called.

His ignorance was understandable: 21 for less than a month and, save for a couple of family functions, never given to violating the drinking age – after all, it was one of any number of infractions that could get him punished or expelled. His recent experience had been a tentative few beers since his birthday. He had caught hell for his reluctance from some of his less dutiful comrades, particularly his roommate Rand Castillo, but he didn't flinch: *Why risk it?* he reasoned. An underage pilot cadet like Neil would get bounced from the program and sent home in disgrace if he had alcohol in his veins. Army grunts like Rand faced no such limitations.

Around him were uniformed cadets, parents, instructors and University of Colorado administrators. Neil inserted himself into the circle of people surrounding Larkin, a 30-year veteran of the United States Space Force and a former

warship commander, now serving out a comfortable pre-retirement assignment as chief of ROTC programs west of the Mississippi.

"I can't imagine they will go to war," Larkin said, answering a question Neil had not heard. "Wars need a few things to happen: One country must want something from another, or else wants to prevent the other from coming after him in the future. Both need to believe they can beat the other in a fight. With Japan and China, the tensions over the things they want from each other just aren't at the tipping point."

"But they aren't very friendly," said an older man, some cadet's father, probably. Neil's own parents were absent from the reception; they had come to his graduation, two days prior, but left before the commissioning ceremony, to attend Neil's brother's graduation from high school back home in Oregon.

"That's true," Larkin allowed. "China would be happy to see Shanghai replace Tokyo as the world's financial capital. But that's not enough. They know the costs of war for both of them would be too high and the payoff too low."

Neil took a bite of the pastry. It was tasty, but not so soft, and, to his horror, it exploded in a crunch. Slivers of sugary confection sprayed from his mouth, landing on the front of his dress uniform and on the floor between his shoes.

Thankfully, no one seemed to notice. He finished the pastry with one bite, chewed large and brushed off his shirt. He shifted his position so his right foot covered the dandruff of crumbs on the floor.

"With all the weapons everyone is putting up there, it's a wonder fighting hasn't started already," said a woman.

Neil saw a shadow steal across the face of the Army cadet next to her. *The woman must be his mother.* Not good for

mom to make even a remotely anti-military statement on commissioning day.

Before Larkin could respond, one of Neil's instructors, detecting an argument in the offing, threw a softball question at the admiral about his stint as commander of the cruiser *Virginia*, and the conversation moved elsewhere.

After the reception broke up, Neil walked across campus back to the dorms, feeling the hot midday sun through his uniform and a slight haze from the wine. He felt unglued, disconnected from himself. *Everything's in flux.*

His next step was clear: fourteen weeks out in California, training as a combat drop pilot over the Pacific Ocean. Then, his assignment. His learning already exceeded that of a one-way assault pod pilot, so most likely he would get assigned to a planetary base as the first officer of a laser-launched ferry. His dream was assignment to an elite Sabre squadron, where he could fly one of the hybrid scramjet-rockets that could make it to orbit and back on its own. Orbital stations kept the expensive craft to carry quick-reaction forces and VIPs into the outback, and some warships had them too.

He was thrilled. Wherever he landed, he'd be flying soon enough.

His roommate, Rand Castillo, and their friend Cade Singer were waiting for him when he returned to his room. Both were also graduating ROTC cadets: Rand was Army; Cade was, like Neil, joining the Space Force. They had cut out from the reception about thirty minutes before.

Rand waved his handheld. "Sergeant Baca came by and said the orders are in," he said, smiling broadly.

Neil opened his own computer and checked his messages.

1400Z29MAY2139

FR MG HARDY, V-3, USSPACECOM

TO 2LT NEIL MERCER, USSF

1. YOU ARE ORDERED TO REPORT FOR DUTY ON USS SAN JACINTO (DS-99) AT VANDENBERG STATION, GEOSYNCHRONOUS EARTH ORBIT, BY 1800Z18JUNE2139.

2. PLEASE MAKE ORBITAL TRANSIT ARRANGEMENTS THROUGH YOUR REGIONAL PERSONNEL OFFICE.

He stared at the screen. His hand shook a little. *Straight to a ship. Nothing about flight training.*

"This can't be right," Neil said. "They've already posted me to a destroyer. Somebody must have forgotten I still need advanced flight."

"Better take it to the colonel," Rand suggested.

"I will." Neil was silent for a moment. "How did you guys make out?"

"Waitlisted," Cade said. "I have to go get a job." It was the worst of all worlds. Cade would have to work in the civilian sector for a few years before giving up whatever career he had started to serve his duty requirement.

"I'm sorry, man," Neil said, feeling a little shame for his initial reaction to his own letter. *At least I don't have to start looking for work. I just have to straighten things out.*

"I got a posting," Rand said.

"Where?"

"Kuan Yin. Space Defense Artillery corps. I'll be trying to shoot your fellow rocket jocks out of space."

"No kidding! Congrats." China had taken the lead in colonizing Kuan Yin, around 11 Leonis Minoris, after the United States had claimed the system but before it could open a wormhole there. After some negotiation, the United States had ended up with a marginally habitable continent.

Colonel Alvarez, the university's ROTC commander, wasn't answering his calls, and it took Neil more than half an hour to locate him. With the campus shutting down for the summer, people were leaving early and Alvarez's assistant was among them. Neil finally found the colonel chatting in a colleague's office. He showed his superior the assignment.

"Congratulations, Neil. That's great you got a ship so soon," Alvarez said. "I know you signed up for flight school, but this is a great opportunity."

"Why didn't I get into flight school?" he said, the wine making him braver than he normally would have been. "I finished intermediate flight last summer. I was told I had passed all the preliminaries for advanced."

"You did. But there were simply more qualified applicants than there were slots. For whatever reason, you weren't picked."

"Isn't there some kind of wait list?"

"No," Alvarez said sharply. "And you should be thankful you got a spaceside assignment. Your class has fourteen Space Force cadets. Twelve of those signed up for service on a ship; exactly three got slots. Plus you. Another two are getting offplanet surface postings; the rest are going to an Earthside or orbital base or into a delayed-entry program."

The colonel's voice softened. "Now, Neil, I know it's not what you were aiming for. I don't know what kind of job they'll have for you on that destroyer, but at least you're getting to space, right?"

"Yes, sir," Neil said, failing to muster any enthusiasm in his voice. He wondered if he'd get command of the vessel's sewage and recycling system.

The trip up, two weeks later, depressed him even more. It was on a Virgin Galactic lightrider, launched from a laser station on the ground.

I should be flying myself up here. Most of the other passengers were business travelers, probably bound for one of the manufacturing plants or hotels in low Earth orbit. Fewer were like Neil, headed for higher orbits or interplanetary craft.

Neil was the only one aboard in uniform. He was wearing his dark blue Class B's, approved for most non-formal work occasions. It drew a few glances, but he was left alone. Many of the passengers chatted merrily across the aisles; from what Neil could gather, they were going to some sort of conference at the Sky Marriott, an affair sure to involve a few morning roundtables followed by lots of freefall partying, all on the company dime.

He was too wound up to sleep. Orbit was nothing new – he'd been up on several family trips, including one to the Moon, plus three months at the U.S. military's basic freefall training station. Best of all, he had served as co-pilot on a half-dozen Sabre training drops, landing and taking off again from spots in New Mexico and in the Australian desert. Sabres were beautiful machines to his eyes, and taking control of one as it burned through the atmosphere at Mach 25 was freedom itself, a thrill like no other.

Before he departed Boulder, Neil and his friends, Rand, Cade and Carlos Encinias, a junior still a year away from his commission, had hit the bars in Denver for what Rand called "a proper drunkening." It was a blur in Neil's memory. Rand the extrovert cracked jokes and spent money and talked up the women, with Neil in his usual role as wingman. Cade, normally brittle in social situations, drank enough to relax and enjoy himself. Neil sobered up early to herd everyone to the train back to campus. It was a futile effort: The train had broken down again, and they were forced to stay the night in the city. Rand picked up the hotel tab.

Neil had gone home to Oregon the next day. His father and brother asked him lots of questions about his service and assignment; his mother listened to his answers and fretted about his safety.

“At least you won’t be screaming around in those planes,” she concluded, satisfying her worries as she always did, by deciding there was a way that things could be worse.

The real treat was a surprise visit from his uncle Jack. Colonel Jack Houston, retired, could remember when the service was still the United States Aerospace Force, and he was Neil's only close relative who had spent significant time in space. During Neil's childhood, Uncle Jack had served on several ships, twice making the trip to Independence, the American colony at Sigma Draconis, and he had gone on one tour through the Japanese ring. It was Jack's stories that had inspired Neil to consider military service in the first place.

The night before Neil left for orbit, he, Jack and his parents sat out back in their backyard, drinking beer and talking, mostly of mundane things. It was a clear, warm night, and Neil leaned his head back and looked at the sky.

For most of history the night sky has been flat; the stars might have been painted on the inside of a sphere. But now the sky has depth. Some of those stars are places we can go to. They aren't points of light; they are locations, as real and as accessible as this backyard.

Neil saw plenty of stars that weren't part of the firmament: starships firing their fusion drives. He could also pick out Vega and Arcturus, both accessible by wormhole. *The stars we can see from Earth are either nearby and useful, or distant behemoths beyond our reach.*

He tried to identify some constellations. For decades, the world's spacefaring nations had built their own wormhole networks, claiming star systems and planets for themselves. The United States, Britain and Australia had spread into

Draco, Cassiopeia and Perseus; Japan had moved into Indus, Pavonis and Herculis; China and Korea into Orion, Leo and Virgo; Europe into Cetus and Pisces.

There was a joke in there somewhere. *The EU and water signs. I guess if we had stuck to form, Russia would have colonized Ursa; China Draco, the Brits Leo and we'd have had Aquila. Except Aquila has been pretty dry territory. And what would have Japan taken? There's no constellation for chrysanthemum. Or maybe they think every rising sun is theirs.* They sure behaved that way, sometimes.

"You'll get another shot at flight school, I'm sure," Jack said, misinterpreting Neil's posture as an expression of distress. Neil straightened his head and looked at his uncle. "Meantime, a destroyer posting is a good one. They may not get the attention that the big flagships get, but you'll move around a lot quicker, unless you hook up with a larger ship and head out in a fleet to show the flag somewhere. Might be in order given the problems with Japan and China."

Neil nodded. Earlier that day, the news had reported some kind of extrasolar mishap between warships from the two countries some weeks back. The American secretary of state made an emergency trip to Beijing, and her British counterpart went to Tokyo, trying to keep the two sides talking. It was expected that concerted international attention would get them to back down again, but a couple of plugged-in Washington reporters, citing "western intelligence sources," reported the mishap was in fact a full-fledged fleet engagement around a distant, habitable planet. The report was denied by Japan and ignored by China.

"There's a lot of pride in play here," Jack said. "Last century, it was Japan who prevented the Chinese government from inheriting the world they are so convinced they are the center of. After the Rock hit, Japan realized they needed colonies in space to preserve the race, but they also went up

there and mined the asteroids and put up the orbital power stations. They built things and got rich, and everyone had to follow their lead. The Chinese missed their chance."

Uncle Jack takes history personally, Neil thought, as the older man drained his beer. He went on, "Now both Japan and China's governments are saturated with people who grew up off Earth, in places where they have known nothing but their own culture, their own sense of superiority. They haven't had to get along with others."

"If they fight, who wins?" Neil asked.

"I can't say. Everyone has been working on space warfare for decades, but it has never come to serious blows. The big boys have been content with proxy wars and beating up on non-space powers. We haven't seen so many well-armed nations, with such a balance of force, in a long time. We've got dozens of technologies and combat doctrines that haven't been proven outside of simulations and exercises."

Jack looked at Neil. "That's the environment you are headed to. Let's hope the stability lasts."

The next day, on the ride up to orbit, Neil recalled the strange emotion Uncle Jack's comment elicited, a knife's edge between excitement and anxiety that he might serve during a conflict. He tried to rid the notion from his mind. *Even if China and Japan did fight, America would stay out of it, as long as the shipping lanes are open to the colonies, and no one's comfortable lifestyle is afflicted.*

Not long after, the spaceplane docked at Christensen Station, one of the big twin-ringed LEO transfer stations that served as a jumping-off point to higher orbits. Neil passed through an extra layer of security to get to the section of the space station reserved for government operations. Beyond, the waiting room for the Vandenberg hop held an even mix of military and civilians, and he felt conscious of his appear-

ance for the first time since the commissioning ceremony. Thankfully, his dark blues concealed the half-centimeter chocolate stain he had acquired from a cookie during the flight up. He hoped.

He looked around for an empty chair and saw an attractive young woman in a Space Force ensign's uniform approaching him.

"You look like you could use some help," she said. She was a head shorter than Neil, thin, with short brown hair. He wasn't sure if the woman was being friendly or trying to take command of him, so he decided on a formal response.

"Neil Mercer, assigned to the *San Jacinto*," he said, pronouncing the "J" like an "H," just as proper Spanish dictated.

"Jacinto! Jacinto! Hard 'J,' like in 'Juliet,'" said a dark-haired male ensign from a seat nearby, smiling broadly. "Damn it, we won that battle! Why can't anyone pronounce it right?"

The woman chuckled. "Erin Quintana. You've found the right group. We've both been posted to the *San Jacinto*, as well," she said, and motioned to the officer who had first corrected Neil. She pronounced the hard "J" too.

The dark-haired officer stood up from his chair. He was Neil's height, thick and muscular where Neil was slim and of average fitness. "Tom Mondragon, from Fort Worth, Texas. Good to meet you, Neil." He offered a hand.

Neil took it. Formality gave way to banter. "Didn't mean to offend your motherland, Tom," he said. "I'd read about the battle, but I'd never heard the name pronounced out loud."

"April 21, 1836. Guaranteed Texas' independence from Mexico. A fine day."

Neil swapped backgrounds with the two young officers. Tom was another ROTC graduate, but older than Neil, just

now going on active duty after four years in the civilian world, working at an entertainment channel.

Erin, meanwhile, was a fresh graduate from the Space Force Academy in Colorado Springs – one of the blessed few who were probably already anointed for senior command. Neil and Erin swapped a few stories about the nightlife in Denver; Neil, no party animal himself, still had more to tell than Erin. She said she was raised mostly in Washington, D.C., and that a lot of her family was in the military. Unlike Neil and Tom, she had traveled extensively, including long visits to Independence and Reunion.

They both agreed, kindly, that Neil had gotten the shaft by not being assigned to flight school. Neil wondered if they were just being polite.

It was a four-hour flight to Vandenberg. The military jumper had a much different feel than the civilian launch. Most of the passengers, including Neil and the other junior officers, rode up in uncomfortable jump seats. The interior of the 70-ton craft lacked the padded, insulated walls and other amenities of a commercial flight; instead, Neil stared at exposed pipes and ductwork. Loud machine noise filled his ears as the craft powered up.

Two USSF senior astronauts – the service's equivalent of a corporal – delivered a safety brief and walked each cabin, obsessively checking passengers' names against a manifest and handing out earplugs, goggles and emergency bubbles to anyone lacking them. A sense of urgency rose in Neil as the jumper prepared for launch. He wasn't sure if anyone else shared it, but here was a feeling of *doing something important*. Not something you got on civilian craft, where everything was done to make it feel like blasting into orbit at 11 kilometers per second was as routine as going to the store.

The pilot came on the intercom and enumerated the upcoming boosts and periods of freefall during the four-hour flight. "Sick kits should be within arm's reach," he said. "If not, let one of the crew know now; otherwise, if you don't get it in the kit, you'll have to clean it up. And trust me; vomit is much worse when it floats."

Some faces in Neil's view smiled at that; Neil felt himself laugh but couldn't hear it over the sound of the jumper powering up.

The flight was uneventful; everyone in Neil's cabin who needed a sick kit found one in good time. Erin, sitting to Neil's right, slept most of the flight. Neil declined an offer to visit the jumper's cockpit; he wanted to go, but he saw only civilians going up and decided joining them might make him somehow appear overeager or inexperienced to the other military personnel on board.

"Suit yourself," Tom said, unbuckling his restraint. "I'm not going to miss this." He launched himself over Neil toward the chute that led to the cockpit. His departure at least gave Neil a better view out one of the jumper's few windows, opened now that the craft had cleared the worst of the Van Allen Belt. He thought he made out Altair. *Japanese space.*

He pointed the star out to Tom at his return. It was a strategic star, he told Tom, even though it was far too short-lived to develop a habitable world. But it was part of the chain that led to EQ Pegasi, a trade hub that linked to European, Anglo-American and Japanese space.

Tom managed to look amused and puzzled at the same time. "How do you remember all that detail?"

Neil shrugged. People always asked him things like that. "How was the view?"

"Pretty incredible. Both Vandenberg and Kennedy are visible." Kennedy was the big American-British-Australian

fleet base at Earth's trailing Trojan point, almost as far away as the sun is from the Earth. It also contained the wormhole to the red dwarf Lalande 21185 – the primary gateway to American space. "Well, you need to look through the telescope for Kennedy, but the commander pointed it out."

About half an hour later, the jumper pivoted around and fired its thrusters to match orbits with Vandenberg, and Neil got a look at the station. Two slowly spinning rings simulated gravity for the base's long-term inhabitants, but the trio of attached large vessel docks were in freefall. Many of the ship berths were filled with warships.

The transport pivoted again, and the *San Jacinto* came into view.

Chapter 2

She was moored perpendicular to the dock, with her bow attached by a gangway to the station. Like all American warships, and those of many other nations, *San Jacinto* was segmented. Her top section resembled an arrowhead and carried the heaviest armor, the bridge and the laser cannon. The center cylinder, attached by a neck, carried the heavy kinetic weapons. The two low-profile twin gun mounts were visible; Neil could also make out the belts that rotated the guns around the hull to maximize their fields of fire. Flat impressions on the cylinder marked banks of missile cells. Defensive lasers in shallow domes studded the hull like blisters. The lower cylinder contained the ship's fusion candle, the fiery, antimatter-sparked hell that moved the ship. The very bottom most resembled a cage; the open sections helped disperse the incredible heat from the fusion reaction inside.

San Jacinto was neither young nor old. Not quite 200 meters from nose to tail, she was painted dull black to keep her albedo down. It wouldn't help much given the easily visible heat signature from her drive, but her designers figured any available advantage was worth taking. Not all nations felt this way; Latin American vessels, in particular, were brightly painted in national liveries. Japanese warships were a silvery white, in part to help reflect laser shots, though they weren't above painting a sizable red rising sun on their warships. China's were gray.

San Jacinto was running on low power and had extended solar panels and a thin black fin alongside the hull, the latter a radiator to offload the heat generated by the ship's power systems.

“What’s that pie slice missing from her central cylinder?” Tom asked.

“That’s where the Multi-Mission Platform goes,” said a civilian on the row above them, who was craning his neck to look out the window himself. “They are switching it out. It’s a feature of the *Lexington* class. They can set the module to fit the ship’s assignment.”

“What can you put in there?”

“A platoon of Marines, or a lab, or a prototype weapon system. Or some stuff I shouldn’t talk about,” the man said, turning his head sideways to look back at Tom and Neil. Neil couldn’t make out his face, but he had short, gray hair.

Spy gear, Neil translated in his head. He wondered who the man was, but neither he nor Tom pressed him for details.

The jumper docked a few minutes later in one of the station rings. Neil and his comrades collected their baggage and made their way toward the docks – don’t want to be late reporting to the CO.

The entryway to the destroyer had the usual bromides posted – “Victory is certain,” “America’s go-to ship” and the like – although a hanging Lone Star flag and a “Pride of Texas” poster gave it some individuality. Tom loved it.

Janet Thorne, commanding officer, *USS San Jacinto*, met them in her small office, attached to her cabin in the forward section of the ship. She was fit, a careful mover and a careful speaker, with close-cropped auburn hair and a face that seemed most comfortable in a mild scowl. She seemed preoccupied with something other than the three greenhorns before her.

“Congratulations on your assignment,” she said, smiling thinly.

“Thank you, ma’am,” the three young officers responded, almost in unison. Neil was having trouble staying at rigid attention in weightlessness; his feet hadn’t found a ferrous

strip in the floor, and his body had a very slight rotation to his right side that he couldn't counter without touching a wall or one of his comrades.

Thorne said, "I'll spend some time getting to know each of you a little later; we've got some classified material coming on board shortly, which I'll need to see to. You will all stand junior officer of the deck and CIC watches, and you will be assigned additional duties within your areas of expertise. It has been a few weeks since I have looked at your personnel files, so remind me what those are."

Neil glanced sideways at the others, unsure who should respond first.

Erin took the initiative. "Kinetics warfare, ma'am."

Tom said, "Communications." He paused. "Ma'am."

Big moment. Neil said, "I'm a dropship pilot, ma'am."

Thorne frowned. "We've got a full complement for our flight detachment; if you were to join them you should have been assigned to the squadron, not to me."

"I know, ma'am. I haven't had advanced flight yet, so I'm not qualified to combat pilot a Sabre."

"I see. We'll mark you down as an auxiliary. There's nothing wrong with having a spare pilot around, so make sure you put in enough training and simulation time to keep your intermediate rating. In the meantime, we'll find something else for you to do."

Neil hadn't expected any better. Still, her words were his unhappiness realized. *This was not the plan.*

"Oh, the next time I see you, make sure you are in your working uniforms," she said. "Officers get their hands dirty on my ship."

Khaki. A hell of a color to wear in space, Neil thought.

"Now, before you go, each of you tell me why you joined the service," Thorne said. Her eyes turned to Neil.

To fly, he thought. "To serve my country," he said. It was the textbook answer, and he felt lame for not coming up with anything better.

"And you?" she said, turning her gaze to Erin.

"To defend my country," she said, with far more conviction than Neil had managed.

To Tom: "And how about you?"

"To pay for college, skipper."

Risky to play the humor card so soon with the CO, Neil thought. But Thorne emitted an abrupt bark of laughter and shook her head. "Dismissed," she said. "Go explore the station. Come back in four hours or when you hear the station intercom play 'Eyes of Texas.' We'll assign you quarters and log you into the ship network. Also, be sure you upload your gene maps to Doctor Avery."

They made their way to one of the station's rings and parked themselves at a restaurant. Neil was tired; he'd been up since 3 a.m. Oregon time. The sensation of gravity, created by the rotation of the station, felt good.

The restaurant had a large window; outside, massive, beautiful Earth swung across the view every 30 seconds, showing sunset over the Rocky Mountains. A crescent Moon, about the same size as it appeared from Earth, chased after it.

The three wondered what classified material was coming on board the ship.

"Maybe some experimental hardware," Erin offered.

"I bet it's something to do with the Japan-China crisis," Tom said. "Maybe we're going to watch some Saki fleet maneuvers." Saki was the not-quite-derogatory term for the Japanese among the ranks. The Chinese were the Hans; the Koreans, the Kims.

"Beats me," Neil said. "We'll know soon enough."

Tom said, "Have some fun, Neil, and give us a little un-informed speculation. We're not going to judge you for it."

Is that why I don't have an opinion? I'm scared it will be wrong? Neil thought.

"I guess the best way to put it is that I don't have that high of an opinion of my opinions," Neil said. They both stared at him.

As they talked, they didn't notice the gray-haired civilian from the launch, who had been sitting near them, press a key on his handheld computer, get up and leave the room.

Neil took a significant bite of his turkey club, causing the toast to crack, and a bold slice of tomato slid out the back and landed on his plate. He was contemplating reassembling the sandwich when someone sitting nearby said, "What's that?" and pointed out the window, at Earth.

Neil saw a pinpoint flash in front of the planet. Then another, and another. *Looks like LEO*, Neil thought.

Lots of people in the restaurant stood up, and voices rose in alarm. A screen over the bar, though muted, displayed a "Breaking News" logo. A text scroll said "Reports of fighting between China and Japan."

The space station's intercom, bizarrely, played a few twangs from a country song. Then, a woman's voice said, "All hands to the *Belleau Wood*. Repeat, all hands to the *Belleau Wood*."

A few seconds of jazz. "All hands, report to the *New Orleans*. Repeat, all hands, report to the *New Orleans*."

Then came the first few notes of what sounded to Neil like "I've Been Workin' on the Railroad."

"That's us," Tom said. "Let's go."

Neil looked at him. "That's not ... "

But the voice on the intercom called all hands to the *San Jacinto*. Tom said, "I promise it's for us. Come on!"

More music played, a cacophony of summons. It sounded like every ship was calling its crew.

They took one of the elevators to the hub of the space station ring, making a rapid transition to weightlessness, then pushed off from the hub and entered the long corridor that led to the docks.

Inside was a stampede in three dimensions. In the excitement, some officers and astronauts alike had forgotten how to move properly in freefall. They caromed off walls and into one another. Others floated free, out of reach of a handhold. Only a friendly push or a long wait for air currents would get them back on track.

At Erin's suggestion, they picked a line of handholds and stuck close to the wall, making a slow, steady pace. They reached the *San Jacinto* ten minutes later. A Marine was posted outside. His single chevron atop crossed rifles and name badge identified him as Lance Corporal Morales. Not recognizing the trio of ensigns before him, Morales checked his computer twice before convincing himself they were in fact part of the crew.

"Ship is at General Quarters. All officers are to report to battle stations," he said crisply.

Erin started to protest, "We haven't received our battle –" but Tom pulled on her arm, and they floated through the gangway tube. "Let's just head for the CIC and see if they have anything for us to do."

San Jacinto's Combat Information Center was three decks below the entry lock. Only Captain Thorne and a senior petty officer, wearing a command master chief's insignia, were present, studying one of the screen panels at the front of the room. Thorne's boots anchored her to the floor; the petty officer floated free.

Thorne acknowledged them with a nod; the chief, whose name badge said "Collins," appeared not to notice them at

all. He just stared at the screen and muttered, "I can't believe they did it. The audacity."

Tom couldn't restrain himself. "What happened?"

Without looking at them, Collins said, "About two hours ago, the Sakis announced they were pulling out of the LEO treaty. They started deploying laser and kinetic sats able to whack China. And, just like that, the Hans started shooting them down. Now it's blossomed into a general engagement all over the Earth-Moon system."

"Anybody shooting nukes?" Thorne asked. "Or anything worse?" Worse could mean biological attacks, antimatter or widespread kinetic bombardment.

"Not that I can tell. We've got warships lighting up all over the place. It doesn't look like the Sakis thought this through; most of their fleet is still moored at the Trojan point." Japan's main naval base was at the gravitationally stable point in Earth's orbit located 60 degrees, or roughly 150 million kilometers, ahead of the planet, just as Kennedy base was the same distance behind.

"What about the Japanese frigate I saw docked here?" Neil asked.

"The tugs dropped off *Asakaze* about ten minutes ago. They're still too close to the station to light their candle," Collins said.

A voice over CIC's intercom: Lance Corporal Morales.

"Combat, this is Morales out front. The station just went on decompression alert and closed all the hatches. I don't think anybody else is going to make it for a while."

"Damn it, they must be worried someone's going to shoot at us," Collins said. "This doesn't make sense."

Thorne hit a button on her handheld and spoke.

"Morales, this is *San Jacinto* Actual. Go ahead and button us up," she said and cut the connection.

Collins looked confused. "Are we going to pull away from the dock?" he asked.

The captain ignored his question and pointed at the screen. "How far away is that?"

A Chinese warship was thrusting, decelerating near the station, not more than 1,200 kilometers distant. It was outside Vandenberg's orbit around Earth, headed toward the Chinese orbital docks, in geosynchronous orbit above Borneo, 76,000 kilometers away.

It was not difficult for the *San Jacinto* to know the ship was there. Because a single fusion candle put out more power than all of humanity could muster two centuries prior, spacefaring vessels were difficult to hide. The Chinese vessel's drive flare was among the brightest stars in Vandenberg's sky.

Data was feeding into the *San Jacinto* from a number of sources, including the station and the half-dozen other American warships moored there, as well as from the American intelligence-gathering network in the near Solar System. The tactical plot identified the vessel as the *Hangzhou*, a light cruiser of 11,000 tons. She had been detected thrusting from the Chinese wormhole to Sirius, at Venus's trailing Trojan point, several weeks ago.

"Can we get a telescope on that? You, Mercer, do you know how to operate that system?" She pointed at a computer terminal labeled "Sensor Ops."

"I think so."

"Point everything at the Chinese ship."

Neil swung himself around to a line of consoles and dropped himself into a chair, full of apprehension. He wasn't certain he could log into the ship's systems yet, but the computer recognized his Space Force username and password. Working deliberately, he called up the sensors interface, all the while fearing the captain would yank him from

the job if he didn't get it running sooner. After 15 seconds, he had the right menu on his screen, which presented him with an option he silently castigated himself for not anticipating.

"Active, or passive only, ma'am?" he asked the captain.

"Active," the captain said firmly. Active sensors would provide more information, but the Chinese ship would be alerted that Neil was looking. No doubt the Chinese would expect that.

Within 30 seconds, Neil had the ship's radar, interferometer and other sensors recording *Hangzhou*. It made sense to ignore *Asakaze*; the Chinese ship held far more secrets: *We haven't watched a Chinese ship fight in years!* Neil thought. *We can learn their capabilities, tactics ...*

Hangzhou was not entirely unlike her American counterparts: segmented, but with a sphere forward instead of an arrowhead. She was longer than the *San Jacinto*, and massed nearly 3,000 tons more.

"She's light, conforming to an extended burn," Neil said, reading the sensor system's calculations. *Hangzhou* was traveling more than two kilometers per second across their field of view.

The captain of the *Asakaze* apparently decided to give battle, even though the ship was only 20 kilometers away from the station. An American watch officer on Vandenberg screamed at him to get further away before engaging, but the frigate ignored her.

It wasn't quite point-blank range for the ships, but it was close – a swordfight instead of a knife fight.

The *Asakaze* turned toward the larger Chinese ship, bringing her nose-mounted laser cannon to bear. Unlike American and Chinese vessels, Japanese warships were built in a single long section that looked like two planks, crossed at a 90-degree angle. The nose sloped inward to a point, giving the vessel the appearance of a cross from the top and

a dart with pared-down fletchings from the side. Only the drive, comprising the bottom section of the hull, was cylindrical. Some joked the ship looked more like a pencil or a Phillips-head drill bit. The design had fewer weak points and was more structurally sound than its segmented counterparts, but the vessels were harder to repair and maintain because of fewer access points to vital systems.

"Right in front of us," muttered Collins, shaking his head. "The Saki is brave; I'll give him that."

Inside *Asakaze*, a dozen laser engines, spread throughout the ship, generated powerful beams of infrared light. The beams passed through synthetic garnets that tripled their frequency into ultraviolet, an ideal wavelength for deep space warfare. A network of mirrors and pipes inside the ship combined the beams into one before splitting them again into four equally powerful beams.

On the ship's hull, armored shutter blades, not unlike the iris of an old still camera, retracted to expose the frigate's big primary optics.

These optics focused the invisible laser beams on their target. For an eyeblink, the lasers connected *Asakaze* with the Chinese ship. *Hangzhou* was armored with a mash of structured carbon, boron and other hardening elements, and the lasers took a quarter of a second to drill through the protection into the vessel's interior.

Even as the beams did their work, a web of pinhole optical cameras wired into *Hangzhou's* hull studied them. The cameras fed data to a defensive control computer, which compared the information to its files on ships of *Asakaze's* design. The computer deduced the precise origin of the beams, and ordered an array of counterbattery lasers to fire "up the beam" of the attacking cannon. *Asakaze* let its lasers linger too long on *Hangzhou*, and Chinese counterbattery beams slashed into the Japanese ship's unarmored optics,

disabling two cannon and damaging a third before its shutter could close. The Chinese counterbattery computer updated its records in hopes of improving its chance for another hit should the Japanese lasers strike again.

Less than half of a second had passed since the laser officer on *Asakaze* had fired the weapons.

In the *San Jacinto's* CIC, Neil watched in fascination. Counterbattery response time was prized intelligence. He flagged the data for Space Force analysts before returning to the camera view of the *Hangzhou*.

The cruiser pivoted to point her nose at the Japanese vessel and issued a salvo of three dozen missiles. Her main lasers targeted the frigate's top quarter. In her three gun turrets, shells accelerated through electromagnetic coils and launched. The missiles and gun rounds would take more than a minute to arrive, but the lasers immediately burned several holes in *Asakaze*. One penetrated and hit a line containing liquid coolant, which sprayed into space. Another damaged a fire control computer, delaying the launch of the frigate's own missile barrage.

Asakaze's own counterbatteries fired, destroying several of the Chinese attack lasers. In seconds, the armament of both ships had been substantially degraded.

Around the CIC, handhelds buzzed. Thorne put a hand over her ear, to prevent outside noise from interfering with the audio from the tiny communicator speaker inside. She listened for a few seconds and pressed a button on the panel in front of her. Around CIC, screens in front of empty chairs lit up.

"The port admiral's worried we're going to get some debris," she said. "He wants all ships to put their antikinetic defenses on standby. Quintana, man the AK station, please."

"Yes, ma'am."

Asakaze released her defensive missiles, which angled toward the fast-moving cloud of inbounds. Eight of *Hangzhou's* attack missiles survived long enough to explode into a hail of depleted uranium flechettes, all of them pointing toward *Asakaze's* hull. The Japanese frigate activated point-defense lasers and picked off the darts one by one, but there were too many, too close, moving too fast.

More than 50 flechettes struck *Asakaze*, burrowing through armor, metal and, in a few cases, flesh. Some dug long rents in her side. Clouds of gas and liquid sprayed from breaches into the interior. She yawed slightly, still carried by the momentum of the final thrust. Two shells from *Hangzhou's* guns blew gaping holes in her hull.

Ten seconds. Twenty. *Asakaze* did nothing.

Neil called up a camera view of *Asakaze*. "I think she's dead, captain," he said.

"Any debris headed our way?"

"None that I can see ... wait ... yes, radar has some debris from the Saki headed toward the station. It will hit in about two minutes."

To Erin, the captain said, "Quintana, weapons free. Splash the inbound."

Erin pushed a control switch from "stby" to "alert," and three of *San Jacinto's* laser turrets rotated and fired. Two other warships moored at the station also shot at the hurtling debris. The mass – a piece of *Asakaze's* hull – was sliced into harmless remains within 10 seconds.

"Radar showing no more threats to the station," Neil said.

Hangzhou pivoted to her original heading, and her main drive refired, returning her to her long deceleration toward the Chinese geosynchronous base. Within two minutes, she had more than doubled her distance from the station. She didn't transmit a word to the Americans.

Neil examined the readouts on the *Hangzhou*.

"Captain, *Hangzhou* probably had the juice to go to mil thrust and stop within a few hours to come back to board the *Asakaze*. But her burn conforms to her previous flight plan toward the Chinese station above Beijing," he said.

After saying it, he wondered if the captain cared. She acknowledged with a nod.

"I wonder what happens next," she said, to no one in particular.

A staff meeting, two hours later, provided a little clarity. *San Jacinto's* new ensigns met many of the ship's officers, who finally were able to come on board after the station went off decompression alert. Most were in a foul mood; they had been trapped for two hours inside a three-meter cube, part of a corridor that had been closed off into small sections during the battle to prevent any errant debris from opening whole areas of the station into space. Captain Thorne introduced Neil, Tom and Erin using as few words as possible, and said the ship's executive officer, Lieutenant Commander Carla Mendoza, would see to their orientation and assignments.

Thorne then summoned Lieutenant Frank Stahl, the ship's intelligence officer, to the little lectern at the head of *San Jacinto's* cramped conference room.

Stahl, a black-haired, sharp-featured, frustrated man, alternated between the obvious and the arcane in his brief. He frequently paused, sometimes mid-sentence, and his eyes darted to Captain Thorne, who had to nod before he would continue. But he got the basics across: A war was underway between Japan and China. On Earth, submarines were fighting in the Sea of Japan, the Pacific and the Arctic trade routes, and cruise missiles had struck several shuttle launch sites and surface-to-orbit laser cannon. In space, Japanese and Chinese warships were engaged in a dozen battles near

Earth, fighting for orbital supremacy. While no one was using nukes, a fleet was already sortieing from Japan's wormhole to Barnard's Star, which orbited in Venus' leading Trojan point, and moving toward China's Sirius wormhole, a mere 64 million kilometers distant. Telescopes had also seen warships moving inside the orbit of Mercury, where massive antimatter farms orbited the Sun, and at Saturn, where countries mined the other two parts of the fusion triad – helium-three and deuterium – from its gaseous depths.

A younger officer, seated in the line of chairs behind the conference table, called out, "What's our position on the war?"

Stahl glowered at him. "Not my responsibility. This is an intelligence brief, not policy or operations."

His insipid response drew some low, sarcastic chuckles from a few of the collected officers. *San Jacinto's* intelligence officer was not popular, Neil realized.

Captain Thorne stood up. "In terms of warship tonnage lost, this is already the largest conflict between two space powers in history. The United States is officially neutral in this fight. The president has joined the U.N. secretary general and the European prime minister in calling for an immediate ceasefire, and for both nations to respect international treaties, custom and human rights toward each other as well as neutral and commercial vessels. We will render aid to ships in distress as long as we are not threatened. In addition, we are to observe and gather information on the foreign powers' combat capabilities, doctrines and tactics."

"So where did this all come from?" Mendoza asked. The XO was a short, stout woman with a friendly face and easygoing demeanor. "I mean, what's the war really over?"

Stahl said, "We really don't know at this point. NSS hasn't noted any recent, significant changes in the political leadership on either side, nor have they projected any

fundamental changes in the military power-economy balance between them. It may be the ongoing issues between them just reached the boiling point, but that's just speculation."

"Who's going to win?" Tom asked.

Stahl nodded. "Both sides think they will, obviously. China has a much larger spacefleet and army, but Japan has technological superiority and a much larger wet navy. We expect attempts to garner allies to be forthcoming."

He recalled the battle between *Hangzhou* and *Asakaze*. Small vessels from Vandenberg had rescued more than 30 crew members of the *Asakaze*, almost all of them low-ranking enlisted personnel.

Neil wondered at the outcome of the fight. *Two ships pound away at each other, with no strategy, no maneuver?* Neil's lessons in space warfare had prepared him for thinking in three dimensions, vectors and available thrust, none of which had played any real role in the recent battle. The training felt a little useless.

As if reading Neil's thoughts, Stahl said, "Now, we don't think this battle or the others we're seeing will be typical if the conflict does not end soon. Both sides were caught unprepared by the rapid escalation to a shooting war, and essentially everyone had to fight with the position and vectors they were cruising with. As we get past the initial fighting, we expect to see more typical engagement scenarios evolve."

Captain Thorne rose. Her officers looked tired and stressed. Neil thought she would say some words of encouragement, maybe make a joke, but she just said, "That's it. Dismissed."

When Neil entered the XO's office the next morning, he was surprised to find the gray-haired civilian from the jumper

sitting beside her. He got his first real look at him: broad-shouldered, almost paunchy, with a passive expression, but very, very alert eyes. *Some kind of contractor?* Neil wondered.

Lieutenant Commander Mendoza introduced him as Jim Donovan. She said he had been assigned as a civilian adviser to the ship for its upcoming cruise, and had requested Neil serve as a liaison between him and the ship's officers.

Requested? Neil wondered. *I don't know him. A friend of Uncle Jack's? Someone who knows one of my instructors?*

"Jim works with some specialized material, so we're going to have to assign you to a position that will up your security clearance," Mendoza said. "You'll be assistant intelligence officer for the cruise. It's not a position a ship this size normally has, but we have some leeway when we're assigned first-cruisers. You'll nominally report to Lieutenant Stahl, but you'll really work for Jim here, particularly when he needs things from the ship. Just keep quiet about the work you're doing for him."

All very strange. Donovan didn't say anything, so Neil asked the first question that came into his mind. "Where are we going?"

"Out-system, through the international ring," Mendoza said. The international ring was a series of stars administered by the U.N. and Red Cross for anyone to colonize. "We'll have more for you soon."

Donovan said, "I need to get back on the station and meet with some folks. Mercer, you're off the hook for a bit, but I'll signal when I need your assistance."

Neil reported to Lieutenant Stahl, who was overjoyed that the CO had at last consented to his request for a deputy. Stahl's team of enlisted personnel didn't have the expertise or clearance to handle delicate matters, like Stahl was sure

Neil would. Neil thought that an odd thing to say, given some of his people were within earshot.

"I assume you had a specialty in intelligence in school, Neil?" Stahl said. It was barely a question.

"No, sir. We covered intelligence in my command classes, but my primary training was in orbit-to-surface craft."

"You're a *pilot*?" Stahl's disappointment was plain. The pang of unhappiness was coming less often to Neil, but it still hurt. And now his boss would hold it against him.

"Not officially. I was assigned as an auxiliary officer."

Stahl sighed loudly and dramatically, the kind of noise that should have turned heads in the small office. But his staffers just stared straight ahead at their computer screens.

The lieutenant laid out Neil's duties. Chief among them would be preparing the afternoon update to Stahl's morning intelligence brief for the captain. His battle station would be in the CIC, working as an aide to Stahl. He also told Neil to sign up for an internal military forum where warship intelligence officers were invited to post anonymous analyses and other thoughts on items of military interest.

The lieutenant transitioned into a lecture about the importance of intelligence: how no good military decision can be made without good intelligence, and how critical it was that intelligence personnel rapidly digest, analyze and disseminate information to the captain and other decision-makers on board. At the same time, they had to consider important security considerations, for some of the Space Force's body of knowledge was secret; indeed, some of it was obtained by clandestine means, and to throw it around willy-nilly could endanger vital sources of information. So sometimes intelligence officers had to speak up to protect the ship, and sometimes they had to keep quiet, to protect the larger interests of national security.

It was all more or less true, all points drilled into Neil's head during his officer training. Yet Neil had a sinking feeling about the assignment. Information was power, as Stahl said, but the lieutenant seemed to regard himself not as its conduit and custodian, but as lord over it all.

During a pause, Neil said, "Did the XO mention I am to be working as a liaison with some civilians who will be with us this cruise? She suggested that would be my primary duty."

Stahl's eyes narrowed. "She mentioned you'd have some additional duties of that nature, but you should be clear that I am to be your section chief."

That's not quite the way Mendoza put it, Neil thought, but he said nothing, deciding a protest would mean little. Things would work themselves out, he figured.

Neil's afternoon interview went better.

Donovan and his assistant, Rafe Sato, received him in their cabin, which had been installed only yesterday in *San Jacinto's* Multi-Mission Platform. The cabin was big, bigger than the captain's quarters. And there were several adjoining rooms. Neil wondered what was in them.

Donovan spoke to him casually: offered him a seat, which he accepted, and a drink, which he declined. Sato fiddled with his handheld computer and seemed to be paying only passing attention to their conversation.

"Rafe and I will come to you first on all but the most urgent matters regarding the ship's activities. We might need to borrow a tech from time to time for some assistance, and we will of course clear that through you," Donovan said.

"Understood," Neil said.

Sato looked up and chuckled. He was a hawk of a man, tall, tan and lean. "You're being cruel, chief. The curiosity is killing him," he said.

Donovan said to Neil, "I suppose you have only been told we're civilian advisers?"

"Yes, sir."

"Enough of this 'sir.' We certainly aren't military: Rafe and I are with NSS," Donovan said.

Neil felt a wash of realization. "NSS" stood for the National Security Service, heir to the old Central Intelligence Agency, rebranded a century prior as punishment for one-too-many mistakes that made the news. The NSS did the same things, saw similar secret successes and suffered from similar public failures as its predecessor, though now it had a sphere of more than 30 colonized worlds and 300 keyholed star systems to keep track of. Its public relationship with the U.S. military, particularly military intelligence, was as rocky as ever, so it was a surprise to Neil they were being afforded travel on the *San Jacinto*. He wondered if they were simply hitching a ride or if they were the specific reason for the upcoming cruise.

"Is there anything in particular you will need me to do?" Neil asked. Donovan didn't fit Neil's image of a dashing secret agent, though his big frame and confidence gave him a larger-than-life quality Neil found hard to ignore.

"I'd appreciate it if you would come down here and brief us in the morning," Donovan said. "We're patched in to the ship's network, but there are a few things, particularly data on nearby ships, we aren't able to access. Mostly we just need you to remain flexible for us."

Neil nodded. Donovan said, "Now, any questions for me?"

"Several. What's our mission?"

Donovan said, "We're headed out to Entente to pick up some people who have an interest in the war."

The data came to Neil's mind, unbidden.

Entente, fourth planet of Beta Comae Berenices, colonized in 2107 under U.N. authority. Seventh or eighth habitable planet found. Population 3.7 million. Diverse; nations were allowed to colonize assigned islands and continental regions, so it's the most Balkanized planet after Earth. There are several independent countries, and separatist and guerrilla movements in various areas.

"It's not the nicest neck of the woods," Donovan said. "But it's a good place to hide if you don't want to be found."

"Can you tell me who we are going after?"

"Some folks who can give us good advice. That's about all I can say right now; I'll let you know more once we get underway."

Neil relaxed. He was still eager for information, and Donovan seemed willing to share some, despite Neil's junior rank. "We're not getting a lot of details on the war. How bad is it?"

"It's bad. I don't think either side is going to back down. It looks like Korea is formally going to declare war on Japan, as well."

That wasn't a surprise. Korea and China were allies, and the two Korean colony worlds were in the Chinese sphere.

"I'm surprised the war didn't start two months ago," Donovan went on. "There was much more than a 'mishap' around a new colony world."

"So the news report was true," Neil said.

"More or less, given our agency leaked it to the press," Donovan said. "A Chinese colonization fleet passed through a newly opened keyhole to an orange dwarf out in Eridani and found a Japanese fleet already in the system. They had opened a keyhole of their own from another nearby system about two months earlier, despite the U.N.-affirmed Chinese claim to the system. The colonials called for help, and a Chinese battle fleet showed up several weeks later, and the shooting started. The Chinese chased the Japanese fleet out

but sustained heavy losses in the process. The two governments clamped down on reports about the fight, and we've been waiting for the next shoe to drop."

All this space, and we're still tripping over one another, Neil thought. "How did we find out about it?" he asked.

"Sources and methods, Neil."

"I'm sorry?"

Donovan smiled. "First lesson of intelligence: Don't ever expect an answer to a question about our sources of information or our methods in obtaining it. That's the stuff we have to protect the most; if we burn a source, we very likely lose that source of information for good. Word gets out we burn sources, and fewer people want to talk to us."

Neil thought that one over. "Fair enough," he said.

"In any event, I don't know how long we're going to be able to stay out of the war, either," Donovan said.

Neil swallowed. "Really?"

"I hope I'm wrong. But President Delgado is no friend of China's."

News to me, Neil thought.

"Perhaps the prospect of our entry into the war on Japan's side would cause China to consider a ceasefire," Donovan said. "But I imagine if their back is to the wall they'll come after us with the stick rather than the carrot."

"I doubt President Delgado would respond well to the stick," Rafe Sato interjected. Delgado's "American Pride" platform was built around returning the country to its former glory, not kowtowing to stronger foreign powers.

Donovan didn't argue the point. "Maintaining neutrality is going to be tough. One missile goes astray here in orbit and we've got several thousand dead Americans and a *casus belli*."

"One last question," Neil said. "The XO said you requested me as your liaison. Any particular reason?"

Donovan said, "What's the strategic value of AD Leonis?"

Neil's response was almost immediate. It took him more time to form the sentences in his head than to recall the information.

"Well, the star itself is a red dwarf and a flare hazard. It has a few planets, but I'd have to look up how many and their types. I have never heard of any mining there, so I would gather that the strategic value is that it serves as a critical keyhole junction for the Hans and the Kims, part of the path to both Korean planets, plus Kuan Yin and Entente. It also links to American space, so it's a trade hub."

Donovan said, "Well done. I'd overheard you talking to some of your shipmates on the hop to Vandenberg and later on the station. You have a pretty solid command of how intelligence works. Most of your colleagues probably wouldn't know half of that about AD Leonis. Your recall isn't perfect, but it's pretty good. While anyone can look up almost anything, intrinsic knowledge is the key to the quick analysis your superiors will want. If you know something, you can think about it. But more importantly, you phrased your response like an intelligence officer, despite your limited training. You not only answered the question, but you told me what you knew, what you didn't know, and you distinguished your facts from your opinions. That's the proper way for intelligence officers to deal with information, Neil. It usually takes quite a bit of training for someone to organize their mind properly like that, but it comes to you pretty naturally."

Neil reddened at the praise. Donovan impressed him. The NSS officer said, "How are you in languages?"

"Pretty fluent in Spanish, plus decent Japanese."

"Hmm, that's not so good. Translation programs or no, it helps to be able to read things in the language they were

originally written in. I'd suggest you start learning Mandarin, then move on to Cantonese and Korean."

Neil and Tom were assigned to the same quarters, an arrangement that suited them both. It was cramped, of course, with enough floor space for a single person to stand, jammed between two sleep nets and a small desk with a computer terminal. They had one closet between them. The room opened into a lounge they would share with the other male junior officers.

After a tour of the ship, Neil and Tom joined Erin at dinner, and they met some of the other junior officers on board.

Maria Sanchez was another first-cruiser, a freshly commissioned second lieutenant of Marines, with oversight of *San Jacinto's* small detachment of jarheads. Michael Hayes was the ship's astrogator. Nestor Garcia was the directed energy officer – "directed energy" being military-speak for lasers. Kevan Avery was the medical officer. Hayes was quiet and bookish; Garcia remote and Avery downright jocular.

Neil hadn't seen Erin since the staff meeting; their quarters were nearly on opposite sides of the ship. That was by design: Berths were distributed throughout the ship's fore and middle sections to create distinct male and female country, and to reduce the chance that an accident or a surprise attack would kill most of the crew in a single stroke.

She had smiled warmly at Neil as he sat down. *Attraction?* Neil wondered. A two-year relationship with his distant girlfriend had gone south a summer ago; somehow, in the time since, he had missed out on any success in that department, unlike many of his fellow seniors. He really wasn't sure why.

Erin was pretty and engaging, if a bit reserved. Neil decided he was open to it. Not that he had any idea how to

conduct a shipboard romance. Of course it was discouraged; of course it happened.

Avery, who everyone called "Doc," jokingly congratulated Erin on her first "kill" – the debris from the *Asakaze* yesterday.

He said, "I hear we're leaving the Solar System on this cruise. Who hasn't been through a keyhole before? There's a tradition on board that we shave your head on your first trip out."

Neil gulped. He liked his hair, even with the regulation short cut used in freefall.

Seeing his expression, Hayes said, "Doc is kidding. Aren't you, Doc?"

Tom said, "Good. Nobody touching this lovely mane." His hair was shorter than Neil's.

Neil said, "It's my first trip out, too." Sanchez was the only other officer at the table who had not been through a keyhole before.

"Why do we call it a keyhole, anyway?" put in Garcia. The construction of the first traversable wormholes in the last century had opened up the stars for colonization. To expand to a new star, countries launched tiny carrier craft, bearing one mouth of a wormhole pair, through interstellar space at relativistic speeds. The other mouth stayed at the origin. When its mobile partner arrived at its destination, they were widened to create a perpetual shortcut through space.

Tom said, "This one I know. It's shorthand. We're too bureaucratic to call it a wormhole, so we use the formal, scientific name, 'Krasnikov-Hirasaki Event.' But that's a mouthful, so we shortened it to 'KH.' But that's too hard to understand over comms, so we expanded it again, to 'keyhole,' because Kilo-Hotel sounds stupid."

"Brilliant," Avery said, corralling a piece of chicken that had floated out of his tin. "You new kids got your assignments yet?"

Erin said, "Ordnance officer and assistant gunner."

"Nice," he said, smiling at her, and some part of Neil suddenly regarded the doc as competition.

Tom said, "I'm a comms guy, but since Lieutenant Vikram is already our comms officer, the skipper made me CIC officer. Seems like a decent gig. I just do what Chief Palowski tells me to do."

Neil said, "I'm the assistant intelligence officer for analysis. It's usually a chief's billet, but they got me, instead."

Avery said, "Stahl. Ugh. I'm sorry to hear that. But it should be pretty interesting reading all that classified stuff on the war, yeah?"

"Once I get to read it, sure," Neil said.

"So does anybody know our mission?" Avery looked around. "They seem to be keeping everyone in the dark."

A round of negatives from everyone, save Neil, who took a bite of bread. It was stale and crusty, and crumbs fluttered away. Neil stared at them in frustration. *How do people eat bread without making a mess?*

Avery noticed his silence. "C'mon, Mercer, what do you know?"

Neil tried to think of a way to evade the question, to answer without really answering, or to blow it off with some kind of joke. But nothing came to him.

"I'm sorry, guys, I really can't say. Orders."

Avery smirked. "Can you believe it? Even the new guy knows more than I do."

Neil sat silently, knowing more but wondering what he could responsibly say. He wondered if his new job would mean a permanent gulf between him and his crewmates.

Chapter 3

As *San Jacinto* crossed the Wolf 359 system, Neil settled into shipboard routine. His daily eight-hour watches in the CIC largely consisted of observations of the ships thrusting between wormholes in the system, marking vectors, rates of propellant use, and the like. Using automated cameras on the hull, the ship scanned its sky constantly for points of light that matched no known star or planet in the database. When it found one, it would alert the sensor tech, usually an enlisted astronaut, who would examine the picture and decide whether to point the ship's long-range sensors – an optical interferometer and an infrared telescope – at it. Occasionally the tech would discover a new asteroid this way, but an errant luminous source usually meant a ship.

That's where Neil came in. If a ship was close enough, and not "in the baffles" – dead below, on the far side of *San Jacinto's* drive flare – he and the tech could derive a vessel's drive characteristics, mass, acceleration and other interesting information by watching its drive output for a while. It was easy to tell a military candle from a civilian one; given enough time observing the drive plume, you could usually work out the drive's manufacturer – an important clue in figuring out who the ship belonged to.

The tricky part was getting the ship's distance, which was the key to figuring out most of the rest. It takes triangulation, but it's a very thin triangle when a single ship tries to observe another vessel hundreds of thousands of kilometers away, using two telescopes separated by a few dozen meters on the hull. *San Jacinto* could get a pretty accurate distance reading out to a million kilometers or so; for anything beyond that, Neil would have to release one of the ship's

drones or communicate with another ship for an accurate calculation.

He had plenty of traffic to monitor. Wolf 359 was a busy system, one of the first reached by wormhole from Sol, and there were no less than six wormholes orbiting it. Most ships were freighters; he tracked three colony transports – colloquially, “cattlecars” – plus a starliner, warships of several nationalities, as well as a few executive yachts and courier ships. But no Japanese ships were in the system, and *San Jacinto* had no reports of any fighting here so far.

Neil trained. He learned about foreign militaries: their leaders, their ships and their doctrines. He learned about the divide between those who gathered intelligence and those who analyzed it. He learned about all the kinds of intelligence he was responsible for: imagery (IMINT), sensor data (MASINT), and foreign communications (SIGINT) chief among them. He was surprised to learn he also had to stay familiar with “open source” intelligence (OSINT) – information published by news outlets and on internet forums. There was a lot of garbage to sort through, but occasionally you could find a real gem. He skimmed through the guidelines on human intelligence (HUMINT) – how to get information from human sources.

This was Donovan’s specialty; a ship’s intel officer rarely had an opportunity to work with foreign nationals. Still, Neil might someday find himself at an interrogation or an embassy party on a planet’s surface.

Twice a week, Neil also served as junior officer of the deck. The shipboard lingo, which Neil and the other new ensigns quickly adopted, was to “turn tricks on the deck.” That meant a four-hour watch on the bridge conning the ship, always under the watchful eye of the actual OOD, who was one of the senior lieutenants or chiefs. The trip through the Wolf 359 system was a simple one, and the deck tricks

usually turned into school in how to run the ship for Neil and the other ensigns. Neil had the fortune to serve as the junior OOD during turnover – the 180-degree change in facing in the middle of their journey. With no friction in the void, the only way a ship could slow itself was to point its tail at its destination and thrust, counteracting all the velocity it had built accelerating during the first half of the trip. Braking on a planet's atmosphere could somewhat mitigate the need for a powered deceleration, but not every destination had a planet with an atmosphere. A complete acceleration, turnover and deceleration between two points was called a "flip."

But Neil quickly grew annoyed with another kind of flip – the odd, sudden sensation of having turned on his head, when, in fact, he hadn't moved at all. It was one of the unpleasant aspects of adjusting to near-freefall conditions. When the *San Jacinto* was thrusting – which was most of the time – "down" was toward the drive, giving the ship's interior a layout like a tower, with multiple, narrow decks. From the crew's perspective, the ship was perpetually headed up, toward a location above their heads. *San Jacinto's* usual cruise thrust was ten milligees and change, enough so something dropped would eventually hit the floor, but below the threshold of providing any sensation of weight. The first few days of vertigo and nausea were the worst, but Doc Avery gave them the right pills, and the feelings soon passed.

Daily exercise helped. Everyone on board was required to exercise under simulated gravity for an hour a day, lest muscles become flaccid and bones deteriorate in the absence of the real work that standing on a planet required. The ship wasn't wide enough to comfortably rotate on its long axis to provide this simulated gravity, so during normal flight *San Jacinto* extended two chambers on booms on opposite sides

of the ship and spun them along a belt. The arrangement could provide about one-half Earth gravity, enough to where exercise felt useful, showers were cleansing, and food stayed in the pan. One of the chambers was set up for sports; however, the Coriolis effect made games involving loose or thrown balls pretty unlikely, although some tried. For most, fencing and a no-kicking, small-field variant of rugby were popular. When the gyms stopped spinning and reverted to freefall, teams quickly formed for a three-dimensional version of basketball.

Several weeks of war news had provided little hope of a ceasefire anytime soon. Korea joined China and declared war on Japan, helping China win control of Saturn. This seriously threatened Japan's fuel supply for its fleet in the Solar System. The final battle for orbital superiority around Earth was expected in a few weeks; after that, one side could potentially bombard the other on the surface.

In Washington, an argument in Congress over the war had nearly come to blows between one representative from Hawaii and another from California. Supporting his ethnic cousins, the former had introduced a bill to declare war on China; the latter, a competing bill to declare war on Japan. It was the first time anyone had introduced a bill to declare war without the president first asking for it; it was also the first time that competing declarations had been sought against two belligerents. Neither bill had any real support; the majority of Congress, including many with Asian heritage, appeared determined that America stay neutral. The politicians were going so far as to challenge the media's naming of the conflict the "First Interstellar War," favoring the moniker "East Asian War" instead. Most of the American public seemed relieved the war didn't involve them; voices calling for the United States to try to broker peace were

matched by those arguing the war was to America's advantage, as two strategic competitors battled to the knife.

On a Friday while the ship crossed the Wolf 359 system, Captain Thorne invited the ship's junior officers to dinner. Some of Neil's older colleagues commented it was about time; most captains had their officers to dinner within the first three or four days of a cruise. But Thorne was not a social captain, and Neil had the feeling the invitation was distinctly pro forma.

It was a surprise, then, to find Donovan and Rafe Sato in attendance. Neil saw Donovan daily, but Sato only rarely. Neil had the feeling Donovan's technical aide didn't like him very much; in any event, the NSS officer spent a lot of his free time down in the enlisted women's area.

The meal was stuffed burritos; they and their foreign equivalents were popular with cooks in space, because biting into a wrapped tortilla in freefall didn't send little pieces of food flying in all directions, as it would with a sandwich. Still, Neil found a way, and he watched a small cube of diced tomato spin toward the ceiling, where it was caught in an air current and pushed slowly toward a ventilation grate.

The captain politely didn't notice. She spent most of the meal prompting talk among the juniors, querying Neil and the others on their hometowns, families, and education.

As the main course was concluding, she said, "I believe we're passing near the Recons 2 wormhole; is that correct, Mister Hayes?"

The astrogator swallowed some food and said, "Yes, ma'am."

Erin, seated next to Neil, put her fork down and stared into her tin.

Recons 2, red dwarf, part of the wormhole chain down to Leviticus, orbiting Alpha Mensae, Neil recalled at once. *Leviticus used to be called Jefferson, until Reverend Jessie Cameron exhorted*

his flock to move there. It wasn't long until the colonists declared independence, saying America had betrayed its Christian values, and renamed the planet.

"Has anyone here been to Leviticus?" the captain said. "I am curious how our lost colony is faring."

Erin looked at the captain. She was rigid.

"Yes, ma'am. When I was a child."

"Do you remember much?"

"Yes, ma'am. My parents were stationed there during the revolt."

"Did they see action?"

"They were killed."

"Oh," Thorne said. "I had no idea. I'm sorry."

Tom was nodding slightly. *She must have told him, Neil thought through his surprise. Did she decide I wasn't worth telling?*

The Jefferson rebellion was mostly peaceful, and most U.S. loyalists were allowed to leave without incident. But some violence erupted, and in one case, zealots demanded a U.S. Army company stationed on the planet leave behind their weapons. The soldiers refused and a firefight erupted. Seven soldiers and around 40 rebels died. *Including the Quintanas.*

"It's okay, ma'am," Erin said. "I was only three at the time. They did their duty."

"They must have served with President Delgado's mother, then," Nestor Garcia interjected.

"Yes, his mother was my folks' CO," Erin said. Juanita Delgado had died with the Quintanas. Her sacrifice was a frequent subject of pre-election biopics on the president.

"Did you go to Earth?" Thorne asked.

"Yes, ma'am. My uncle and aunt, who were assigned to the Pentagon, raised me and my brother."

The captain nodded. "I did a desk trick at the Pentagon when I was a lieutenant. Were they named Quintana?"

"No, ma'am. Westlake. It was my mother's brother and his wife."

"Hmm. I don't recall any Westlakes, I'm afraid."

"Yes, ma'am," Erin said. The captain turned her attention elsewhere and did not address her again. Erin appeared not to notice the looks of respect being afforded her by the officers around the dinner table.

That night, Neil worked up the nerve to go down and introduce himself to the commander of the ship's flight detachment, a lieutenant named Rodgers. His callsign was, of course, "Buck." Rodgers agreed to allow Neil some simulator time and maybe, just maybe, a drop or two in the jump seat for trainees on board one of his birds. The meeting was cordial enough, but Neil couldn't shake the feeling that Rodgers regarded him, a not-quite-pilot, as an eagle might regard a caged parakeet.

As *San Jacinto* crossed the Wolf 359 system, Neil ran through three simulated battle drops in his off-duty hours and didn't crash or get shot down during any of them. He hoped Rodgers paid attention to the simulator logs.

Neil smirked as he read the brief on the FL Virginis system. Planetary names were often a dead giveaway to who discovered them; irreverent ones like Marble and Pea could only come have from California. Sure enough, he read, the discoverers were two astronomers from UC Berkeley. East Coast and European scientists went for more dignified titles, from mythology or the arts. Asians tended toward idyllic names. If a planet was habitable or otherwise particularly important, the politicians would rename it something patriotic: America's primary colonies were Independence, Liberty and Columbia.

It had been three weeks since *San Jacinto* had departed Vandenberg, and the destroyer was now motionless near the Wolf 359-FL Virginis keyhole, waiting for an inbound space train to clear. She had made her first wormhole transit this cruise 19 days prior, from the international station at the Earth-Moon L-4 point into Wolf 359. After this crossing, she would have two additional red dwarf systems to traverse before reaching the Entente system.

Wormhole stations always included two curved plates at opposite sides of the wormhole loop, which maintained the opening with energy from the attached solar array. Facing the mouth was a series of guidance rings that directed ships into the KH event itself. Many wormhole stations had refueling facilities for ships; some, like the Sol-Wolf 359 junction, served as a port for the big colony ships. Millions of colonists had passed through those, trading whatever life they had on Earth for land on a virgin world.

The warship had about an hour before the wormhole's traffic control computer would give it clearance to pass through, and Neil reported to the CIC to assist Stahl in preparing a report on the vessels known to be in the system beyond.

He quickly hit a snag. The robotic U.N. wormhole stations were supposed to keep freely accessible data on the locations of ships in international space, but Neil could only call up month-old reports. He had the comms officer, Daphne Vikram, contact Wolf 359's manned U.N. station, which confirmed that, yes, some kind of computer virus had wiped the database, and they hadn't been able to restore any recent data. He and Stahl took this to Lieutenant Commander Merrill Davis, the ship's operations officer, who was the senior officer in the CIC at the moment.

Davis, *San Jacinto's* third-in-command, was one of Neil's favorite people to work for. He had come up from the

enlisted ranks and was closing on his fortieth year in the service. He'd crack jokes for anyone except the captain, and he cared little about rank except when it came to running the ship. He wanted the job done right, but he didn't mind if folks had fun doing it. Neil reflected that between Davis and the XO, *San Jacinto* wasn't a bad place to work. Carla Mendoza, for her part, was simply competent – scratch that, she was extremely competent. She knew which jobs to delegate and which to oversee directly. She was easy to get along with and kind toward the newer officers.

Captain Thorne was another matter. Neil had few doubts about her capability as a warship captain, but he had developed a low opinion of her ability to be a leader. She interacted little with the crew and usually just barked orders at most of her officers. They were the right orders, but no one took any pleasure in receiving them or carrying them out.

"So, what you're telling me is we don't know whose ships are currently in FL Virginis?" Davis asked. "Damn, the virgins always give me the most trouble." To no one in particular, he asked, "Anybody remember that whorehouse on Reunion? Same story."

Among the half-dozen crewmen in earshot, only Stahl didn't laugh. When the noise subsided, Neil said, "I'm afraid so, sir. Best guess is either the Hans or the Sakis have released a virus into U.N. traffic control to cover their tracks."

"What about our intel packet on the comm buoy?" he asked. The fleet stored encrypted intelligence on commercial communications buoys, which was, in theory, available for download only to other U.S. warships.

Stahl shook his head. "Sir, I queried it, but it's even more out of date. Once we get through we can ping some freighters for their data in addition to our own sensor sweep."

"Ugh. I hate to ask the merchies for help, but we'll do it if we have to. Could you guys ask the station for their logs of who has passed through here recently?"

"Can do, sir," Stahl said. "For what it's worth, we tracked seven drives, six civilian candles and one high-efficiency candle with Chinese military specs, all decelerating toward this wormhole since we entered the Wolf 359 system. Presumably, they all went through."

"Good to know, good to know," Davis said. "Okay, carry on."

Passage through a wormhole is unremarkable; it is as complicated as walking through an open door. A ship accelerates toward it and goes through. Those on board experience no particular sensation; visually, there's no long tunnel or bright flash, just a shift in the field of stars.

San Jacinto emerged from the wormhole in largely empty space, save for the wormhole's support structures: guidance rings, solar panels, a cluster of containers and the robot ballast tug. The destroyer's gyms were retracted, so the ship's extremities didn't brush the extreme spacetime curvature marking the outer edge of the wormhole. Given the tidal forces there, that would be catastrophic.

They went through at General Quarters; Captain Thorne decided the lack of data on the ships in the system was a good excuse for a drill.

It turned into a long day for Neil and the other members of the intelligence and detection sections. First, a reconnaissance drone transited the wormhole and scanned the vicinity with cameras and radar, transmitting its negative findings back to *San Jacinto*. Thorne ordered the destroyer through a few minutes later. Her cameras hunted for lights out of place in the firmament, searching first along the expected path of

ships traveling the quarter-AU between the only two worm-holes in the system.

They found several, the same ships that had been ahead of *San Jacinto* in Wolf 359. The nearest were a cluster of three slow Chinese colonial transports and a small military escort ship, about a day ahead, presumably heading for China's enclave on Entente.

Twelve hours later, Neil returned exhausted to his cabin to find Tom reading in his hammock. They hadn't seen much of each other lately; Tom routinely stood overnight and early watches, where Neil tended to start in the late morning and work into the evening.

Tom said, "How was your day, honey?"

"Just fine, dear."

It was their usual banter, the opening round of what typically devolved into an exchange of recycled jokes, bad imitations and quotes from the comedies.

But Tom held fire. Instead, he asked, "How's the intel world treating you?"

Neil thought that one over. He'd been too busy lately for any real self-evaluation.

"Other than Stahl, not bad, I guess," he concluded. "I'd always thought of intel as glorified office-work for everybody but the field spooks, but it's actually pretty interesting. The access to information is fantastic. Lots of boning up on foreign fleets, and the stuff sticks with me pretty well. I read reports on Chinese and Japanese politics, profiles of their admirals and captains and their combat doctrines. I feel like I'm learning how things really work – as long as it's not the U.S. of A. you ask me about."

Tom nodded. "Glad to hear the post is working out for you. Because, if you don't mind my saying, you just don't strike me as the ramjet jockey type."

The pang of a career diverted, again. It was softer, now. Neil fought with himself for a moment. Tom was his best friend aboard; still, this was crossing a line. But Neil defaulted to civility, not confrontation, and he suppressed an impulse to snap at his roommate.

"You think?" Neil said. He couldn't keep all the sarcasm out. "Look, we're not all the steel-jawed, skirt-chasing extroverts from the movies. We've got those types, sure, but ..."

"Well, sure, you don't wear sunglasses all the time or have that thousand-klick stare, but that's not what I meant. When did you first think about becoming a pilot?" Tom asked.

"I guess before I was a teenager. I always loved those sleek machines. My uncle, who was in the service, noticed and got me onto some military bases to poke around. I think he was subtly trying to influence me to sign up." He smiled at the memories, felt his edge departing. *Tom's not trying to be a jerk.*

"And your long-term plans?"

"I figured I'd put in eight years or so and then think things over," Neil said. "Either stay in the full thirty and get the nice pension, or jump to civilian service and start making real bucks. Lightriders may not be Sabres, but they still need pilots. Not sure how it will work out now. I suppose I'll keep applying for advanced flight school."

"Just my opinion, Neil, but I think you'd find piloting pretty boring after a while. Don't get me wrong: Those guys have pretty exciting and important jobs. But, in the end, they are operators, working with tools. Their whole job is to use them properly and to train constantly so they react correctly when something goes wrong. You strike me as too much of a thinker for that kind of work over the long-term. Your mind is always going; you're always worried about something. I

bet they'd let you pilot for four years then promote you like crazy, so they could push you into a desk job, developing operations doctrine or something."

Is he right? He sounds like Donovan. Tom's sharper than I have given him credit for. But the conversation had gotten too one-sidedly personal for Neil's comfort.

"What about you, man?" he asked. "You'd be handling comms gear if you weren't running the displays up in CIC, wouldn't you?"

"I'm not your tool-user type, either. When I was about 12, I snuck a look at my psych profile. It said I was a 'people person.'" He snorted at the term. "My talents lay in handling people, the way one of your pilot buddies handles his plane. I didn't quite understand what I was reading at the time; I took it as career advice, not as stupid test results. So, yeah, I can work the machines, but my real job as CIC officer is *communication*. I manage the staff; I've got to be able to tell them what to do when the captain and XO are giving orders; I've also got to relay my team's findings back to the chiefs. I have to do it quick, and do it right, just like your ramjet jockeys."

"I can think of lots of jobs where you could do that sort of thing back on Earth, and probably get paid better," Neil said. "Why did you sign up? Don't you think I buy that pay-for-college story of yours?"

"Seriously, that part was true, though I picked Space Force over the other services because I wanted to get off Earth. I've got goals, you know."

"Goals?"

"Goals," Tom said firmly. "I'm going colonial once I get out. The colonies are the place to be if you want to raise a family. Land practically for free as long as you use it right, clean air and water, and local governments that know how to leave you alone. The way people were meant to live. So,

yeah, I'm going to claim some land for a ranch for the wife and me and start raising cattle and popping out kids. I figured four to six years in the service would let me see most of the colony worlds, so I can pick the best one and immigrate."

Neil nodded. Cheap, even free, land was the universal draw for the colony worlds. Governments, eager to expand their off-Earth presence and relieve population pressure at home, tried different appeals to get their people to emigrate, some financial, some emotional.

For nations built on ethnic identity, like Japan and Israel, the colonies were sold as a way to preserve the race, should another large asteroid crash into the Earth. The British tried to tug at the old nationalism: "Once the sun never set upon the British Empire; now many suns rise over it." This was a slight exaggeration; the Brits had one planet of their own, plus part of another. For China, it was a *fait accompli* that the Middle Kingdom would encompass many worlds. The government built starships and went, and the people followed. And, as in lots of nations, certain undesirables received a free ticket.

For the Americans, it was anything goes. Groups with money and off-the-mainstream ideologies seized the chance to build a world, or at least a community, according to their vision. Individuals bet on the future wealth thousands of acres of free land would bring.

Neil asked, "Your wife on board with your colonial plans?" Tom had married young.

"She's not thrilled about leaving her family in Texas behind, but her pharma career is going nowhere, so yes, she's on board."

"They say it takes all types to get a colony going, so I guess you qualify, cowboy," Neil said. The unease between them had passed.

Neil found Stahl alone in the Intel department office, which was a relief; the lieutenant preferred to berate his people in front of an audience.

Stahl said, "Ensign, I've talked to the XO about you, and I thought we might try to reset things. Particularly given your background, your work here has been adequate so far. And I realize you are in an odd position having to work with Mister Donovan and Mister Sato half of the time."

Neil tried to make his face appear utterly passive. *What's this about?*

Stahl went on, "So I wanted to give you some advice. I've been around NSS people before. They're all alike. They pretend they are from the State Department until they decide to let you in and reveal who they really work for. Then they expect you to do whatever they want. They'll pull out their silly mystique and pretend to know far more than they actually do. And NSS types from Washington are the worst – they spend half their time playing junior politician, withholding information from the military when they can get away with it and leaking to the news media like a sieve. And they make so many, many mistakes."

"Sir?"

"I say this with your best interests at heart: Don't get too close to them. Their mission is to get people to betray their country, to feed them information for money or to satisfy their egos or whatever. The NSS uses people and spits them out. It may seem like we're all one, big happy family in the national security community, but we're not. At some point, push will come to shove, and they will want you to betray your loyalties. When that happens, remember that the Space Force is your service, your home. We're your brothers and sisters, not the NSS. Tying yourself too closely to the ...

agency can leave you tainted in your superiors' eyes. Think about your career."

Neil nodded and said he would.

"The military's criticism isn't entirely unfounded, although they have wanted our jobs ever since President Truman signed the bill that established the CIA," Donovan said at their meeting the next day. Neil had casually asked about the origin of the military-NSS conflict. "Military intelligence does different work than we do, and in my view that's the way it should be. The NSS follows foreign politics, economics and strategic weapons. The military follows conventional weapons, tactics and leaders."

You also do the president's dirty work, Neil thought.

Donovan went on, "But I disagree with the accusation that we are somehow exceptional in that we play politics in Washington. The Pentagon plays far more games than we ever have to curry favor in Congress and the White House. You know how *San Jacinto* was built? In pieces. Pieces in as many states and congressional districts as the Pentagon could find. Quite a bit more of it could have been made in orbital factories for cheaper than on the surface, but the Pentagon provides jobs; all we really have to trade is information, so we play ball with Congress and the press. It's just the way things are. Tell me, are you getting some pushback because you are working with us?"

"More like warnings," Neil admitted.

"From the captain?"

"Well, I'd rather not say, but no, not her."

"Then I can guess," Donovan said. "Neil, I can't really say whether your association with us will somehow affect your career somehow, although I'm fairly certain the military intelligence community as a whole isn't as petty as ... some within it. You've been a big help to Rafe and me since

we've come on board, and I'll have some work for you once we reach Entente, if you'll volunteer to join us down on the surface. Think it over, and let me know."

Neil knew he would volunteer. He wanted to go down to the planet – who wouldn't? – and this was a way to guarantee a slot on the drop. But the warning from Stahl kept him from accepting immediately. Would being less than reserved with the NSS officers somehow hurt his standing on board, or in the Space Force? *This is frustrating. We're all supposed to be on the same side.*

Donovan excused himself for a meeting with Captain Thorne, leaving Neil alone with Rafe Sato.

"The chief wanted you to read up on Chinese political leadership," Rafe said. "Let me send you a briefing package."

He hit a few keys on his handheld. Neil opened the file, marked "top secret," on his handheld and began scanning it.

Rafe looked at Neil in surprise. "You don't have an ocular?" Ocular implants turned the inside of the eye into a computer monitor. You still had to control all but the simplest functions with your handheld – unless you had Rafe Sato's upgraded model. He had a "hardwire" – a rig installed in his skull that allowed him to think certain basic commands to the computer. It was a relatively new technology, custom-made, and expensive – only the very rich could afford it, or those government officers deemed critical enough to receive one.

Still, Neil thought Rafe's disbelief a little unreasonable. Lots of people didn't have oculars.

"I had a late growth spurt," he said. You couldn't install one until the docs approved it. "Then when I started flight training, the instructors said not to bother, that a pilot needed to learn by flying with the instrument panels first. They implant an ocular for you, free, in advanced flight."

"Well, you'll need one if you stay in the intelligence business," Rafe said, tapping his temple.

Small chance of that, Neil thought. Right?

Sixteen days to the next wormhole, with the Jovian planet Marble growing from a bright light into an actual disk during the final five.

Letters from home: Every few hours the *San Jacinto* pinged the comm relays in FL Virginis and downloaded transmissions for the crew. Software updates made up the bulk of them, followed by intelligence briefings, U.S. fleet positions, news reports and finally personal communications.

His parents wrote; all was well with them, although all the war news was scary. They seemed certain the United States would stay out of it, although the neighborhood was on edge after somebody broke all the windows at a nearby Japanese steakhouse. There had been some ethnic fights at the middle school.

His roommate, Rand Castillo, also checked in.

Neil the Merciless:

I write to you with new wisdom learned on the decks of the glorious passenger liner Estrella Romantica, en route from Earth to Kuan Yin with 280 souls on board: Always wear your uniform on civilian transit. When I arrived, they bumped me to a luxury cabin as a thank-you for my service to the nation. Free drinks, good chow, and best of all, privacy. Who knew Army life was so grand?

Anyway, I have my posting: Space defense artillery platoon leader attached to the 34th Heavy Infantry Brigade, outside of some podunk town called Cottonwood. No word yet on the quality and permissiveness of the women on Kuan Yin, but they aren't bad on spaceliners.

If you space monkeys are ever in the neighborhood, look me up.

RLC

Lucky bastard, Neil thought, thinking of free drinks, spacious quarters, and best of all, privacy.

Uncle Jack also sent a short note, saying he'd heard about Neil's posting from an old colleague and inquiring how the spook world was treating him.

Jack signed off, as he always did, with a few lines of military humor:

Any ship can be a minesweeper ... once.

If you see a bomb tech running, try to keep up with him.

If at first you don't succeed, try orbital bombardment.

Old, tired jokes. Neil smiled in spite of himself.

But Uncle Jack's note triggered a line of thought ... Donovan, too, in one of their daily conversations, had asked him for his thoughts on how the war would go, and Neil felt obliged to do some original thinking and come up with a response.

So do it: Start with the laws of space warfare. Assumptions really, finally playing out in the Chinese-Japanese war.

Chief among them, straight out of Uncle Jack's joke:

To control low orbit is to control a planet. The threat of sustained orbital bombardment on economic targets with lasers or kinetics should be enough to drive any organized, reasonable political body to surrender.

How to control low orbit? First, you have to control high orbit. That means having a stronger space force than the other guy. Correction: Have a stronger *mobile* space force than the other guy. A space station in a predictable orbit, no matter how well armed, is toast for anyone who throws enough gravel in its path.

So far, so good, Neil thought. The key to mobility is fusion fuel. Antimatter to provide the spark, helium-3 and deuterium to provide the energy, all to push a stream of hydrogen

propellant out a ship's tail. Antimatter was the hardest to come by; it was made in large solar-powered factories orbiting Earth's sun and the suns of the older inhabited worlds. It was the most expensive substance anywhere. A gram cost vast millions.

So capturing or conquering the antimatter factories near the Sun was important, but the factories were dispersed across many systems, making it exceedingly difficult to eliminate a nation's supply.

But getting it to a standing fleet was another matter. Warships typically carried at most several hundred milligrams of antimatter, enough to keep its fusion candle lit for six months or so. Specialized freighters were required to resupply a fleet, and these could be targeted ...

Commerce war. Stop the antimatter flowing and the fleets will eventually stop moving. They become space stations, waiting to die.

The freighters, too, had to come through the keyholes, choke points vital to controlling a system. Prediction: The belligerents will pay, and pay big, for neutrals to supply them with antimatter if their own ships are stopped. The only response: Illegal search operations on foreign commercial vessels, or unrestricted warfare on them. This could cause a small war to escalate into a big one.

Then what? You've hit the enemy's antimatter, stopped his fleets and taken high orbit. Low orbit is another matter. There, you are in range of his big surface-to-orbit lasers, like those Rand would command. They were more powerful than shipboard lasers and had an entire planet as a heat sink, so they could stay cool and fire more often. But they were immobile, so they were potentially vulnerable to bombardment or a land assault. Large, slow-moving vehicles had to stay under the shield provided by the lasers; outside of it, they could only hide and hope not to be found. Indeed, the

Army planned for major land battles to be fought around fixed laser defenses.

Neil rubbed his eyes and recalled some of Donovan's words: "I don't know how long we'll be able to stay out of it."

War with China? The United States and China had long regarded each other as strategic competitors, but the trade and cultural ties between them had made many presume that war would never happen between them.

But the reality was different. Trade between the two nations, once in nearly symbiotic alignment, had actually declined in the last century. It was bizarre, really, that 100 years ago it was cheaper to manufacture a two-dollar gadget halfway around the world and ship it to the United States, than it was to just build it at home. Oil shortages coupled with the widespread adoption of home assemblers – devices able to manufacture simple items like shoes and handheld computer cases – had made trade of simple consumer goods a largely outmoded concept, but more complex items, like foodstuffs, electronics and weapons, were still bought and sold on Earth. Raw materials came from asteroids; power came from the solar satellites. The economies of the major powers had come to depend more on their access to orbit than on one another. Global interdependence had waned, but the newfound wealth of the spacefaring nations had prevented any major conflicts from breaking open.

So why would America take on China now? *Eh, above my pay grade. Leave that aside.*

Instead, think *how* America could hurt China.

No way would Congress pass one of those wacky declarations of war unless the United States was attacked directly.

So if not overt ... then covert.

How do you screw with China and not get caught? China is massive, industrial, tightly governed. Not a dynamic

fusion of cultures like the United States. But not monocultural like Japan, either ...

Minorities. You could stir up the minorities, within Chinese territories and in their satellite states. But how?

Neil's handheld buzzed, loudly. It was Stahl.

"Report to Combat, immediately."

"Aye aye," Neil said. He wondered what was up; he wasn't scheduled to go on duty for another ten hours.