

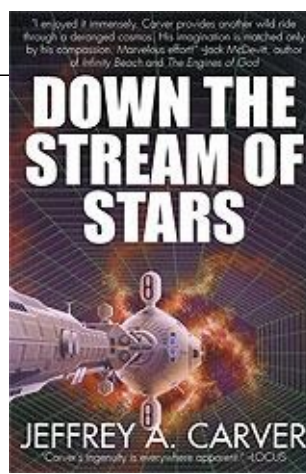
"I enjoyed it immensely. Carver provides another wild ride through a deranged cosmos. His imagination is matched only by his compassion. *Marvelous effort!*" -Jack McDevitt, author of *Infinity Beach* and *The Engines of God*

# DOWN THE STREAM OF STARS



JEFFREY A. CARVER

"Carver's ingenuity is everywhere apparent." -LOCUS



# **Down the Stream of Stars**

by

## **Jeffrey A. Carver**

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**Jeffrey A. Carver**

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*For Alexandra,*

*With wonder and anticipation*



# PROLOGUE

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## Epigraph

*"For I dipped into the future,  
far as human eye could see,  
Saw the Vision of the world,  
and all the wonder that would be;  
Saw the heavens fill with commerce,  
argosies of magic sails . . ."*

—Alfred, Lord Tennyson

### **Starship *Elijah***

#### **Alpha Orionis A (Betelgeuse) Remnant**

#### **Year 181 Sp.**

Clouds of ejected star matter billowed luminously into space like the breath of a mythical god. The ghostly ball at their center was all that remained of the once-mighty sun, Betelgeuse. Three years before, the supergiant had blazed forth in a vast supernova explosion, transforming itself from a living star into a funeral pyre that had briefly outshone the Milky Way. Its ghostly appearance now betrayed the unusual nature of its death. No ordinary supernova—even one ending, as this had, in a black hole—would have contracted and darkened in quite this way. Its smoky translucence spoke eloquently of the invisible forces that had bound it into an oddity of cosmic proportion, an object of Prometheus-like power and mystery.

Its outer layers blazed in the viewscreen as the starship sped inward through the remnant clouds. The display changed every few seconds, highlighting various aspects of its structure. Many on the bridge found their glances drawn repeatedly to the image on the viewscreen. Starship *Elijah* was diving toward the stellar remnant through the shifting reality of K-space, and tremendous computing power was at work creating that image out of the streams of data pouring into the ship.

Most of the crew were busy at their consoles. But one person, seated at the rear of the bridge, ignored all else but that irresistible vision of the star's ghost. She faced it with her eyes half closed, focusing on its presence with her memory, her imagination, her inner vision. Tamika Jones cared not at all about the astrophysical data streaming across the consoles. She was searching for just one thing, and that was the touch of a mind—a mind that she hoped still lived out there in the remnant of a once-living star. It was a mind she had not felt in three years, not since the moment of the star's death.

In that moment, she had felt *him* die, too—had mourned his death. But in the midst of her grief, she had hoped, prayed, *felt* that the man without whose genius this strange, unprecedented *thing* would not exist, had somehow passed through the shadow of death, through the heat and fury of a supernova, and lived. And that was why she was here now, to search for this man who had perhaps survived death. She was here to find Willard Ruskin.

She felt the stirring and muttering of her shipmates' minds around her, like memory-voices chattering and distracting her. That was the effect of the continuous altering of the K-space that carried the ship inward toward the unknown. Transitions through K-space boundaries produced a

involuntary cross-linking of neighboring minds—which could be alarming when unexpected—but they were counting upon it now to join them with Willard, or his companions, or whatever might remain of them. She hardly knew what the mind she was seeking might feel like—reaching to her across the gulf of space that separated them from the star, and from whatever lay in the twisted continuum beyond it.

She hardly knew, really, what she was hoping to find.

What her shipmates hoped to find deep within the supernova remnant, close to the black hole inhabiting its core, was the opening to a new interstellar gateway—a structure that would whisk *Elijah* and untold ships to follow at some unimaginable speed toward the galactic center. It was for that gateway that the majestic Betelgeuse had died at the hands of Project Breakstar. It was for that gateway that a fantastically stretched loop of flawed space had been caught and anchored to the resulting black hole. It was for that gateway that a man named Willard Ruskin, and his best friend Max, had died.

*Elijah* was flying headlong toward a singularity where known space-time ended and something else began. No one knew precisely where the passage into the gateway lay. Eight robot probes had failed to find it, or to return. At a nearby console, astrophysicist Thalia Sharaane was studying the data streams with ferocious concentration. Possibly she would find clues to the gateway's opening on those consoles, but her friend Tamika had no such hope. And yet Tamika *knew* that if she could just reach out to the mind of Willard Ruskin . . . if she could locate and touch once more the man she had loved . . . she might, just might learn from him the way to enter the gateway.

She squinted at the changing image of the sun, growing visibly larger by the second, and searched outward with her thoughts, desperately trying to ignore the jabber and clamor of human intelligence around her.

A movement by the captain made her aware of an announcement. "Sixty seconds from go-around point. Let me know, people, if you're getting anything." He queried the individual bridge officers, then Tamika. "Ms. Jones?" Not answering, Tamika strained to reach out . . . beyond the prison of her own skull and her own mind . . . to reach beyond the bounds of this ship with its clamoring crew . . .

The captain's voice became urgent. They dared not venture too close to the black hole, not even K-space. "Thirty seconds, Ms. Jones. If you don't have anything, we've got to get out of here."

She drew a deep breath and exhaled with exquisite slowness, listening to the meaningless jabber around her, and was about to tell him, *No, nothing, do what you have to do—*

And then she saw it.

Saw him.

Saw the face of Willard Ruskin, peering at them out of the viewscreen. She pointed, unable to draw a breath, unable to speak. The captain turned, opened his mouth. "What—" And when he checked the time again, his face tightened with indecision.

*Tamika, it is you . . . ?*

Was that her imagination, or had she actually heard—

*Tamika . . . and Thalia! Yes!*

That was not her imagination. Thalia had risen at the sound of her name. And then she seemed drawn back to her console. And Tamika heard, and *felt*, Thalia tell the captain, "Keep going! Turn the

nav-control over to me. I think I can get us through!" And Tamika heard, "You *think*—" and saw the captain gazing fiercely at Thalia, with only seconds to decide.

And then she was aware only of the mind that was welling up out of space and merging with her own . . .

*So long it has been . . .  
 . . .how long?  
 Can we even know?*

**My children, do you sing ?  
 Can you know ?**

Who are you? Willard, is it you? And who else?

*I/we know you  
 Otherlife . . . entering us . . . so strange  
 but welcome  
 so new*

Is it you? Willard?

*Tamika  
 I love you  
 we loved you  
 yes  
 and  
 Thalia*

I don't understand . . . what is happening?

**Who are we ?  
 and you ?**

*Be with us  
 Come*

Tamika was suddenly aware of a flood of thought and knowledge pouring into Thalia, through Thalia . . . was aware of Thalia's connection to the cogitative console, and the knowledge streaming through her, the mapping of the gateway entrance passing through her and into the nav-control.

And Tamika was aware of the K-space fields changing dramatically, and the ship altering course, shifting through the tricky matrices of unknown space, diving perilously toward the core of what had once been a star and was now an opening in space-time itself . . .

She was aware of space slipping and altering its very nature around her . . . and she felt Willard Ruskin's presence, and his love, or something very much like his love, now with staggering power and clarity. But it was much more, he was not just Willard now; he was different, astonishingly different.



there were others present with him, or were they *part* of him . . .?

~~She heard the exclamation "N-space!" and felt the ship passing through a turbulence, and the~~  
into a smoothly flowing *something*—and she had the distinct feeling that they were speeding down  
fast-moving channel, and she heard cries of amazement and fear. And when she opened her eyes she  
actually saw in the viewscreen an ethereal channel opening like a tunnel to receive them, its banks  
stretching backward past them, and all around them the blurry shapes of what looked like star clusters  
and clouds.

As she saw all of this, her mind was filled with greetings and joy and surprise, and she felt the  
presence not only of what-had-been-Willard, but also a Logothian named Ali'Maksam, and an assassin  
named Ganz, and the mind of a sun named \*Bright\*. And all of her pent-up hopes and fears and joy  
fell away like spilling tears, and she felt herself opening to receive memories and feelings that she  
could not have dreamed of . . .

And she knew, dimly, through the choir of voices and thoughts, that they had succeeded. The  
starship had passed into the gateway and was speeding inward now into the galaxy . . . inward toward  
what, they could scarcely imagine . . . speeding down a fabulous, glowing river of stars . . .



# PART ONE

---

Year 269 Sp.  
CLAUDI

*"All the rivers run into the sea; yet the sea is not full."*

—Ecclesiastes 1:7

\*

## A word of explanation . . .

I should make one thing clear at the outset, and that is that I am not the hero of this story. It is true that I followed the story and its aftereffects with great interest, and on occasion took certain actions to steer events; so I can hardly lay claim to perfect objectivity. But much of what follows I do not fully understand myself at the time, and much has been reconstructed from long, late conversations with the principal actors. If I seem defensive about certain of my actions, it's because, I guess, I am—but please understand that I was only trying to make the best decisions that I could under difficult circumstances.

Now, I know that many have blamed me for what happened to Willard Ruskin in the matter of Project Breakstar . . . in the bewildering events that opened up the inner galaxy to all of Greater Humanity. Rightly or wrongly, I took much of the blame for the nano-agents that played havoc with his memory, and even the blame for his death. And I accept a share of that responsibility. But I ask you to remember that what happened to Willard Ruskin in the creation of the gateway was altogether bad.

May we talk about the gateway itself?

Unquestionably, the starstream, as it has come to be known, has been a mixed blessing for the galaxy and for Greater Humanity (a term I will use for now, if I may, to include all members of the Habitat). It has brought both wonder and peril, and who is to say which is the greater? I confess I cannot. *War*, for example, is a terrible thing to contemplate; and yet, was it a price worth paying for that our peoples might inhabit vastly larger tracts of space? Was it worth war, and penalties even more terrible, for the knowledge and opportunities gained, for the newly discovered races? How can one weigh such gain for all of civilization against the deaths of billions, and the devastation of at least one entire planetary culture?

That is a question that I have been trying to answer for the better part of the last century.

If I may briefly review:

This story starts, really, with the creation of the gateway structure by Willard Ruskin, et al., back in the year 178 Sp. The details of the political fallout from that event have filled volumes. Following Project Breakstar, two years passed before the debris from the Betelgeuse supernova cleared enough to allow even the earliest tentative efforts to chart the gateway structure. But with the famous first passage by Tamika Jones and Thalia Sharaane (and, coincidentally, the discovery that the gateway was alive and sentient), the new diaspora of Humanity into the deep galaxy had, for all practical purposes, begun. The gateway soon became the greatest thoroughfare in the history of Humanity, or of any other known race.

Within thirty standard years, dozens of star systems previously well beyond the reach of the Habitat already sported burgeoning colonies. Six intelligent races had been discovered, two of them spacefaring. In general, the interracial contacts had been friendly, or at least not actively hostile. Most of the hostilities that existed during this period could be traced to preexisting tensions among the various old factions of the Habitat of Humanity.

Then in the thirty-second year, a planet known as Riese's World was discovered orbiting an unstable sun, near the inner edge of the Orion galactic spiral arm. Also discovered was the remains of the Riesan civilization. Their world had lain almost directly in the path of the gateway. Before Breakstar, their sun had been as stable and trustworthy as any. Not so, after. The Riesans, who coincidentally had been on the verge of achieving spaceflight, had been unintentionally decimated by Breakstar.

Guilt and self-recrimination resulted from that discovery. But not war. War came later. Forty-one years later, when the Enemy, the Karthrogen, the Throgs, came storming up the starstream from somewhere even deeper toward the heart of the galaxy. What the Karthrogen wanted, no Human knew. Where they came from, no one was sure. All that was known was that when Karthrogen and Human met, Humans died. Usually in large numbers. Planetary numbers.

This story is about that war. But it's also about other matters—the settlers of one of the new worlds, for starters.

Even in the face of the Enemy, Human expansion into deep space continued unabated—slowed a little by the war, maybe, but only a little. One was generally at greatest risk during passage through the starstream, because that was where the Karthrogen were most likely to appear. But despite the losses, most people never saw, or ever would see, a Throg. It was often said that one was statistically at greater risk riding a shuttle into orbit than riding the starstream. (It was untrue, to be sure; but it was often said. Sometimes what is said is more significant in human terms than what is true.)

There came a time when a particular colony-ship was making its way down the starstream, stopping off at a few systems along the way. An interstellar circ-zoo was on board, along with a full complement of colonists. Among the latter were a young Human girl traveling with her parents, and a young boy who became her friend. This story is about them, and about some of their friends at the circ-zoo. And the reason their story is important is because of what they learned about the Throgs. And because of what they learned from, and taught, the starstream.

It's also about Willard Ruskin, and about \*Bright\*, once known to Humanity as Betelgeuse, and about the others who died with them—or what they became. And yes, it's about me, Jeaves, cogitative intelligence.

If you want to know more than that . . . well, I suggest you let the story unfold.

May I freshen that drink for you? As you wish. I'll be right here if you need me. Just give a call.



# Chapter 1

---

The starship's deck hummed beneath Claudi Melnik's feet as she stood in the empty corridor looking both ways. There was a certain stealth to her look, because this section of the ship was not yet officially open to passengers. But Claudi (eight years and some of age, standard) was curious, and on an exploratory mission. She wanted to see what was down here, where all kinds of signs pointed to "circ-zoo" that would be opening soon. All of the main doors to the circ-zoo seemed to be closed; but there was a small door down the corridor from the others, and that one had winked open at her casual touch on the control plate. The room beyond beckoned silently.

Like most children her age, Claudi was driven by an insatiable curiosity, and she had very little sense of fear. As far as she was concerned, if she got caught, she got caught. It wasn't as if she was doing anything *wrong*, after all. She was just looking.

She still had a little time left before she had to get to deck-school. And that room looked extremely interesting. After a momentary hesitation, she crept through the open door. Her heart beat faster as she looked around. She saw clear-domed enclosures of the sort used to hold animals in zoos. Most of those near the door looked empty and small but she glimpsed larger ones in the next section of the room. And where there were enclosures, surely, there would be animals.

*Animals!*

She tiptoed forward, peering around hopefully.

\* \* \*

Something was moving out beyond the enclosure. It was a blur, and it shifted first one way, then the other. Lopo, squinting nearsightedly, could only hope that whatever it was would come close. Something danced in his mind, a fleeting image of a small keeper; it seemed connected somehow with the blur outside. It was a startlingly pleasing image. Then it was gone. Lopo blinked in puzzlement.

The teacher, behind him, was making *hrrrrm*phing noises, trying to get his attention. But the lupeko was bored with his teacher. He was more interested in learning what was outside. He strained to pick up the movement and the scent. But the enclosure blocked out most scent—and now the thing was retreating, fading to a blur of nothing.

In disappointment, Lopo turned back to the rear of his enclosure. A pile of comfortably musky blankets lay heaped in one corner. In the other corner were two basins, one for food and another for water. The keepers were not feeding him much lately, which made him a touch grouchy; but the water, at least, he could control. He pressed a small pedal with his forepaw, and a stream of water swirled into the bowl. Lopo lapped at the water—then raised his head, thinking he had sensed movement again. Or was he just imagining?

There it was! The blur, coming closer. And a voice, tiny and high-pitched: "What *is* it? A dog? Or a fox?"

It was almost near enough to see. It was just a little taller than Lopo was when he sat up on his haunches. The creature stepped closer, and finally came into focus. It was a keeper—and a small one. How extremely odd. Lopo wrinkled his nose, sniffing. The smell of the thing wafted only faintly to his nose, but he could tell that it was different from the usual keeper's—a lighter, almost flowery smell. The creature moved very close to the enclosure wall now, putting its face close to Lopo's. Lopo cocked his ears and studied the face, topped with yellow hair and dotted with bright blue eyes. "Hi," it said. "Are you a dog? What are you doing in there? My name's Claudi. What's yours?"

Lopo blinked, tipping his head one way and then the other. He understood the words—some of them, anyway—but he couldn't reply to them, and so he just peered back at the keeper, hoping she would say more. *Hi*, he knew. *Dog*, he knew. *Name*, he knew. But how the words worked together, he wasn't quite sure. Nor did he understand why the little keeper was asking him about dogs. *Claudi*, he didn't know at all.

The keeper glanced furtively to one side, then the other; then it pressed a small hand to the side of the enclosure. Lopo wished that the bubble-wall would go away.

Another voice came from somewhere out of sight—the voice of the regular keeper, Joe—loud and full with surprise. "What are *you* doing in here?" Joe's familiar large shape appeared behind the small one.

"I was just looking at your dog," said the small keeper, turning. "I wasn't doing anything."

Joe put his hands on his hips. "You're not supposed to be in here, you know. Just circ-zoo people are supposed to be here. Anyway, that's no dog. That's a lupeko." He pronounced the word "Loo-pee-ko-oh." Then he went on, "Do you know what lupekos are?"

"Nope," said the small keeper.

"You haven't seen the big one we have on display out in the zooshow?"

The little one shook its head, back and forth.

"No, of course not. We haven't opened the galleries yet. Well, we'll have to get you a look at it later. They're very smart animals. And they like little girls."

*Little girls!* thought Lopo. *So that's it.*

"What's your name?" Joe asked.

The little girl pointed at the lupeko without answering. "What's wrong with this one?" she asked.

"Why, nothing's wrong with it. He's just very young, and hasn't learned to talk yet."

"Talk?"

Joe nodded. "That's right. Say, don't you want to tell me what your name is?"

"Uh-huh." The little girl smiled, swinging her arms. "What did you say it was called?"

"A lupeko." The keeper chuckled. "And *you* are—?"

She ducked her head shyly, and in Lopo's mind her face suddenly shone, sparkling and vivid. He had never met a keeper like this! His heart welled up. She seemed so . . . *likable*. "Why is it called lupeko?" she asked.

"To make little girls ask questions." That brought a giggle, and Joe added, "Fair's fair, now. Would you tell me your name?"

There was a moment of silence. Then very softly she said, "Claudi." *Of course*, the lupeko thought. She had said that before.

"That's a nice name. Claudie what?"

"Melnik."

"Claudi Melnik. Well, hi—I'm Joe. Joe Farharto."

She swung back and forth. "Hi."

"Well," Joe said, "I sure didn't expect to find a pretty girl wandering around in my back galleries. You're not even supposed to be able to get in! I'd better check and see if the door got left open."

There was no answer from Claudie, while the lupeko mulled over the fact that *Claudi Melnik* was indeed a nice name. He rolled the name over in his thoughts, wishing that he could speak it aloud.

"Since you're already here," Joe said, "I guess I could show you around a little. Do your folks know where you are?"

Claudi shrugged. She stepped closer to the enclosure again, coming back into focus for Lopo.

"Can this one talk?"

~~"Lopo? No, like I said, he's too young. His speech hasn't been installed yet. But he can understand you, probably. Do you want to say hi?"~~ Joe crouched beside Claudi, peering into the enclosure with her. "Hello, Lopo. Would you like to meet Claudi?" Joe tapped on the enclosure wall. Lopo backed away cautiously, then pressed his nose forward again.

"Hi, Lopo," said Claudi.

The lupeko ducked his head self-consciously and wagged his tail.

"Can I pet it?" Claudi asked.

Joe's face frowned. "Well, I don't—"

"Please?"

He sighed. "Well . . . I guess there's no harm. Wait right here." He disappeared, then reappeared with something shiny in his hand, which he touched to the enclosure wall. Lopo couldn't see anything happen, but a soft wave of keeper-smells wafted into his face. He lifted his nose toward them.

Joe's large hand came through the enclosure wall and ruffled the back of Lopo's neck. He raised one ear. The touch felt good, but he was more interested in the little girl. Her hand seemed to hesitate, then reached out to touch his nose. He sniffed at her fingers wonderingly, then licked them with a quick movement of his tongue. He caught a taste of something salty and sweet.

Claudi squealed and pulled her hand away. "It's okay," Joe reassured her. "He won't hurt you. You can pet him if you want."

Yes, please, Lopo thought.

The girl hesitated, then reached out again. Lopo kept very still, until he felt the hand brush the top of his head. He raised his head a fraction of an inch and let out a small sigh of pleasure. She began petting his head. Lopo closed his eyes, relishing the feeling; he opened them again to look up into her eyes. They flashed bright and clear and blue, just like the image in his mind. He was smitten—by her eyes, by her light flowery smell, even by her hesitation. Something made him feel as if he had always been waiting for just this person, just her touch. His tail wagged furiously. Stay, don't go, he wished.

"I think he likes you," Joe said.

Claudi didn't answer. She just kept petting him.

"I guess we'd better close it up again."

Claudi gave Lopo one last pat. Then Joe made the wall become solid again, and Lopo pressed his nose to it. "Bye, Lopo!" Claudi said. Lopo made a throaty whine.

"You want to come back and see him again?" Joe asked, ushering the girl away. They both became blurs again.

"Sure," Lopo heard her say, and his heart raced.

"Maybe you'd like to see the bigger one, too. It's out in the zooshow area . . ."

The voices faded, and Lopo was left alone with the ever-present hum in the deck. He watched a long time, whining mournfully once or twice, hoping that Claudi might return; but at last he turned back to his blanket and to the softly murmuring, dimly flickering glow of the teacher. That, at least, was always there—even if it didn't have the nice smell or the friendly touch of a little girl.

But Lopo knew now what he wanted. And it had just walked away, into the blurry distance.

\* \* \*

If Claudi didn't know how the lupeko had gotten its name, the teacher did. It knew that the lupel was a hybrid creature, part old-Earth wolf, *canis lupus*, part picobear from the planet Cardiff. It w



one designer's attempt to create an improved, and highly intelligent, guard animal and companion. The design program was by most accounts a failure, partly due to a tendency to moody dispositions that rendered lupekos unsuitable as guard animals, but mainly because the design lab failed financially before the design could be refined.

The only lupekos still around were those in the circ-zoos. Lopo was one of two aboard starship *Charity*, as part of the J. J. Larkus Traveling Interstellar Circ-Zoo. The knowledge-teacher was responsible for seeing that the lupekos learned all that they were supposed to. But it was the ship's intelligence system, monitoring the teacher, that now observed Lopo's behavior and suspected that something important had just taken place.

The intelligence system wasn't sure what, if anything, it ought to do about it, but it was more determined now than ever that Lopo receive a proper lupeko education. And young Claudi Melnik was already a candidate for special attention.

The intelligence system wasn't completely sure why it had made all of these judgments. Probably it would have said: Call it a hunch.

The intelligence system went more on hunches than most people would have guessed. And quite often its hunches were correct.



# Chapter 2

---

As Claudi hurried away from the back rooms of the Larkus circ-zoo, she noted the vibration of the deck through her feet. She was often aware of this feeling. She enjoyed it; it reminded her that the ship was alive, pulsing and breathing, and carrying her and her family far, far down the stream of stars, maybe even to the very core of the galaxy. That awareness always gave her a warm glow of excitement in her heart. And she was right, of course; the ship was carrying her down the starstream, and though they would not actually be venturing anywhere near the center of the galaxy, that at least was the direction in which they were headed.

Her awareness of the starstream was mostly in her mind. Claudi had never gotten to see the starstream in person—though her parents had promised to take her one day to the observation deck, which was very exclusive and took reservations and everything. In the meantime, the humming of the deck was really the only thing that let her know, day to day, hour to hour, *yes, we're still moving, we're still on our way down the stream*. And she paid attention to it. She noticed any little change in the hum and wondered what was happening in the engines, if they were changing speed or getting ready to pull in at a starport. She felt a sense of responsibility. Who knew but what she might be the first to notice a problem and warn the crew? It could be her alertness that would save the ship. *That* would put her on the road to being a captain some day!

Just now, though, she realized she had better get a move on. She had been so interested in the dog-thing, the lupeko, that she'd forgotten the time. Now she was late again for the deck-school, and she would probably get yelled at by the teaching-wall. And word usually got back to her parents when that happened, and then she caught it from them, too. It didn't seem right. She was already eight, and you'd think that they would understand by now that she could take care of herself. Anyhow, it was worth the minor yelling, to have seen the lupeko-dog. And tomorrow, if that man Joe kept his promise, she'd get to see the other lupeko, as well. Unless, of course, she got grounded for being late to school.

Claudi darted into an open lift. "Deck Defoe," she sang to the lift-controller. She hooked her arm over the railing in the back of the lift and made a whooshing sound under her breath as it shot upward. The door winked open, and she slipped out into the deck-school.

The lift had opened into a big, noisy room with bright green walls hung with all sorts of pictures and things that the kids had made. A class of little kids was letting out now, at least twenty boys and girls hollering and scrambling toward the lift. Claudi walked through the mob, letting them pass around her. She noticed on the wall clock that she was now forty-three minutes late. Ducking her head, she tried to avoid the gaze of Mr. Seipleton, a human teacher, who was just coming out of the first classroom.

"You're late there, aren't you, Claudi?" Mr. Seipleton called.

Claudi sighed and nodded, without quite looking at him. "Yes—er, I have to get in there," she said, not quite pleading, as she glanced at the closed door of her classroom. "Could I—that is—maybe be excused? Okay?"

Mr. Seipleton frowned, shaking his head. "All right, Claudi. But you know the wall's going to ask you the same thing."

Claudi bobbed her head. She knew. That's why she didn't want to have to answer for it twice, she didn't have to. Once was enough. Edging away from Mr. Seipleton, she opened her classroom door carefully and slipped into the back. There were six—no, seven—other kids sitting in various positions around the room. One of them was a stranger, a new boy, who looked at least two years younger than anyone in Claudi's class. He didn't turn, but a couple of the other kids did. One of them, Jeremy

peered up at the clock and grinned wickedly. Claudi glanced away; she didn't want to give him the satisfaction of seeing her embarrassed. She didn't even glance at her friends Suze and Jenny, either, but instead walked straight to her seat and slipped on her headset. They were doing individual instruction now, for which she was grateful. When the silence-screen went on around her, the room went from rustling quiet to dead silence.

An instant later, the voice of the teaching-wall filled her head. It was one of the nameless instructional programs. "Claudi, you're late again. Was there an emergency of some sort that I ought to know about?"

Claudi flushed. "No."

"Would you like to tell me why you're late, then?"

"Well—"

"Were you down on the lower decks again?"

She was glad none of the other kids could hear. "Yes," she murmured.

The teacher made a clearing-of-the-throat sound. "If you don't mind my asking, what were you doing down there?"

"Well, I was looking at something at the circ-zoo, and I just—" She hesitated.

"Just what, Claudi?"

"Forgot, I guess."

"Forgot that you had school?"

"No," she said with a flash of irritation. "The time, that's all." She sighed, wishing that she could just get on with her lesson, instead of being scolded. But you never knew what to expect from the wall in a situation like this; it was designed to be guess-proof, she was sure.

"Claudi—you know that it's important to remember the time, don't you? Isn't that one of the things we try to teach you?"

She nodded silently. "I'm sorry," she said finally.

The teacher let the moment stretch, then said, "All right, perhaps we don't need to bring this up with your parents—as long as you promise to do better tomorrow. May I have your word on that, Claudi?"

"Uh-huh." She nodded in relief.

"All right. Let's get started on your lesson, then. And pay attention! This is an important one!"

Claudi twirled her hair around her finger and nodded. She dutifully watched the screen in front of her seat. A picture was shimmering into focus there—a picture of a planet, golden and green, with swirling white cloud patterns encircling its waist like an apron around a fat lady. The voice of the teacher deepened, saying, "This is the colony world called Daugherty's Hope. It was the first planet to be colonized in the Great Second Push down the starstream. It's important to know about Daugherty's Hope because . . . well, can you tell me why, Claudi?"

She took a deep, shuddering breath. Daugherty's Hope? She'd heard of it—

"Think, Claudi. Remember, when we were talking about the world *we're* going to—"

"Heart of Heaven!" she blurted.

"That's the nickname, yes. But its real name is Sherrick Three—the third planet of Sherrick Star. You knew that, didn't you?"

She nodded.

"Well, when we talk about Sherrick Three, we often compare it to Daugherty's Hope. Do you remember why?"

Claudi pinched her lip, thinking.

If there was impatience in the teaching-wall's voice, it was well concealed. "Let's go over again. It's because the two worlds are very similar. But Daugherty's Hope was settled almost six years ago—and that means we can look to it to see what we might expect on Sherrick Three. For example, we can expect the climate patterns to be similar . . ."

"Claudi, are you listening?"

Claudi started. She *had* been listening. And then, somehow, she'd started thinking about the circus zoo, and wondering how she could get in to see it tomorrow without getting anybody mad at her.

"Okay, then. Now, not only is Sherrick Three—"

"Call it Heart of Heaven," Claudi suggested. "Everyone else does."

The teacher was silent a moment, then *hrrrmphed*. "All right. If it will make you pay attention. Now, Claudi, Daugherty's Hope is similar to Heart of Heaven in another way, too." The image of the planet was turning like a globe; after a moment, it presented a large ocean to her view.

"Its oceans!" Claudi guessed.

"That's true—and a good point! But just now I want to show you something else."

"Oh."

"If you're interested, we'll come back to the oceans. But look here! The other similarity is in *situation*." A map of the Milky Way galaxy appeared, with a tiny patch highlighted, showing the Habitat of Humanity. An arrow pointed inward toward the center of the galaxy, stretching the border of the Habitat like a piece of chewing gum. "When Daugherty's Hope was settled, not many other worlds had been explored that far down the starstream. It was a real pioneer world. Now, you know what that means."

"Um—"

"It means the colonists didn't have much to fall back on in case of trouble. They were in a part of space where very few people had been, except for the explorers who mapped it. And so it was a hard life, by comparison with ours. They had to fend for themselves, while the rest of us, on more comfortable worlds, had all kinds of help available when we needed it."

Claudi nodded. She couldn't help noticing that some of the other kids were getting up from the seats. They had finished their lessons, apparently. Only the new boy was still seated, gazing at his own screen. Jeremy rose and made another face at her, pulling his lower eyelid down in a big leer. Claudie curled her lip and looked back at her screen.

"Thank you, Claudie," the teacher said, with scarcely a break in stride.

"I was listening," she protested weakly.

"I'm sure you were. That's why I'm confident that you can tell me what I just said."

She flushed.

"I was explaining that both worlds were dangerous places to be, because they were exposed. There was the wilderness to contend with, and of course, like most places, there was a certain risk from the Throgs."

"Mm."

"Do you want to talk about the Throgs, Claudie?"

She shivered. She certainly did not.

"Well, that can wait a little while, I guess—until you're ready." The teacher paused. "But suppose we talk about some of the other difficulties that the colonists faced."

Claudi sighed.

"Claudi, it's important—because we need to be prepared. All of us, including you. We're going to a new world, where we won't have all of the things that kept us safe on your old world. We have to be

ready—"

"I know," she muttered. If only she could watch some of those holos that they'd shown back at Baunhaven, holos of explorers on the new worlds! She liked watching them drop in their scout craft through the mists of strange worlds; she liked watching them step out onto alien landscapes, protected by their shimmering shield-suits. She liked watching them discover new creatures, liked seeing them fight for their lives . . .

"Claudi, I get the feeling that you're not quite with me today."

She swallowed self-consciously.

"Suppose we made it more challenging, and set up a sim so that *you* had to make some decision the way real explorers would. Do you think that might interest you?"

She didn't hesitate. "Sure." The teacher had promised such a sim for later in the term. The sooner the better!

"Okay. I'll make you a promise, then. This seems to be our day for making deals. If you pay attention for the rest of this session, I'll set up the sim for tomorrow. It'll be a lot more challenging than the ones we've done before," the teacher warned. "But you have to keep up your end of the bargain. And that means listening today, to prepare for tomorrow. Agreed?"

Claudi nodded silently, rocking her whole body forward and backward. "Teacher—"

"Yes?"

"Can I see the bridge?"

She could imagine the teacher frowning. "You mean, '*May* I see the bridge?'"

"Uh-huh."

"Ask correctly, Claudi."

She sighed. "*May* I see the bridge—please?"

"Very well, but just for a moment. The bridge is off limits now. But here's a playback."

The whole teaching-wall at the front of the room shivered and darkened, then blossomed out into a surroundie, filling the room. Claudi was the only pupil left in the room. She gasped with delight as the starship's bridge took form all around her. Though it wasn't quite as good as realietime, it was exciting nonetheless. There was the captain sitting in his command chair, right beside her, and the piloting crew at their stations; she saw a dazzling array of screens and read-outs—and best of all, down in the front of the bridge, the holopool showing the view of the starstream, the glorious starstream.

What it showed, of course, wasn't a real view such as one might see out the window, even if one could look out a window. She understood that the real view here in n-space was somehow different, though she by no means understood why. But she knew that the starship's intelligence systems took the real view and turned it into something that they could see. It was a vast tube of light, heavenly light, down which the starship floated. And pulsing in the wall of the tube were the glowing beacons of stars, slowly passing the ship by.

Claudi loved to watch the passage of the starstream, even in remote viewing—though she would have preferred to go to the bridge in person. She loved to wonder at those globes of light, to wonder what worlds lay out there beyond the tube. Even right there on the edge of the starstream, she knew there were thousands of unknown worlds, stars that had never been visited, planets yet undiscovered. The teaching-wall had taught her about that, and she'd listened carefully. If it seemed that she didn't pay attention, that was only when the teacher talked about things that didn't interest her.

The image in the holopool suddenly changed. In the place of the starstream there appeared a complicated graphic, which she couldn't understand at all. She envied the bridge crew, who did

understand it. But after a few seconds more, the surroundie vanished.

~~A teacher's face appeared in the wall—and suddenly she smiled sheepishly. It was the face of~~ "Mr. Zizmer," the holoteacher who was the boss over all the other teacher-programs. Mr. Zizmer was a round-faced man with short dark hair and laughing eyes. Those eyes were sneaky, though, because the thing about Mr. Z was that he could be laughing with you and poking you into working harder at the very same time. And she could tell he was about to do that now.

He stepped out of the wall and came over to crouch by her. "Claudi, tell me something. Would you like to be able to understand all of those instruments you just saw on the bridge?" She blinked at him. "Would you like to know everything the crew knows about flying the ship?" he asked.

She hesitated, then nodded vigorously.

"Good! Well, Claudi, I want to teach it to you. As much as I can, anyway. But—" Mr. Zizmer's forehead wrinkled up.

*But.* There was always a *but*.

"If you want to understand those things, there are other things you have to learn first. That's the trick, Claudi. There's always a price. And the price is, to know the things you want to know, you have to pay attention—and learn your basic science, and your math, and—"

Claudi nodded glumly as he talked. She didn't really mind learning all that stuff. She just wished it were more fun. They'd had better teaching systems back on Baunhaven, in her opinion. Except for Mr. Zizmer; she liked Mr. Zizmer.

"So let's go through some of your math challenges now, and then I'll give you just a little head start on tomorrow's sim, and then we'll call it a day."

With a sigh, Claudi leaned forward and peered at her screen, where a strange series of figures had just appeared. She nodded and began moving her lips silently as she concentrated on working out the equations in her mind.

\* \* \*

Forgive me—I hope I'm not being overly insecure, breaking in again like this—but I thought you could hear some of you wondering at the wisdom of a teacher that allows an eight-year-old girl such latitude. I can hear you thinking, "That child needs direction. Love and understanding, yes; but she hardly needs pampering, etc . . ." You're probably thinking that if real humans had been put in charge of educating her instead of robots, she would have known the meaning of discipline.

Well. To you, it might seem that way. But you weren't there, remember. I would put it to you that this teacher suspected possibilities that were not necessarily obvious to the casual observer. Therefore I would ask you to reserve your criticism. The teacher might not have made perfect decisions; but it was doing what it thought offered the best hope of nurturing certain seeds of potential in an eight-year-old girl—seeds that it sensed might be of more than passing importance.

So the teacher wasn't ignoring the need for discipline in the girl's life; it was just going about instilling it in a different way. And that was part of its reason for scheduling a sim for the next day. This sim would test the children more than any the teacher had put them through before. It had its reasons for trying to steepen the children's learning curve, even if its reasons were based on a hunch.

In any case, the teacher was listening to me, so don't blame the teacher. I hope it doesn't spoil the suspense to say that on this occasion, events proved me right.

By God.





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