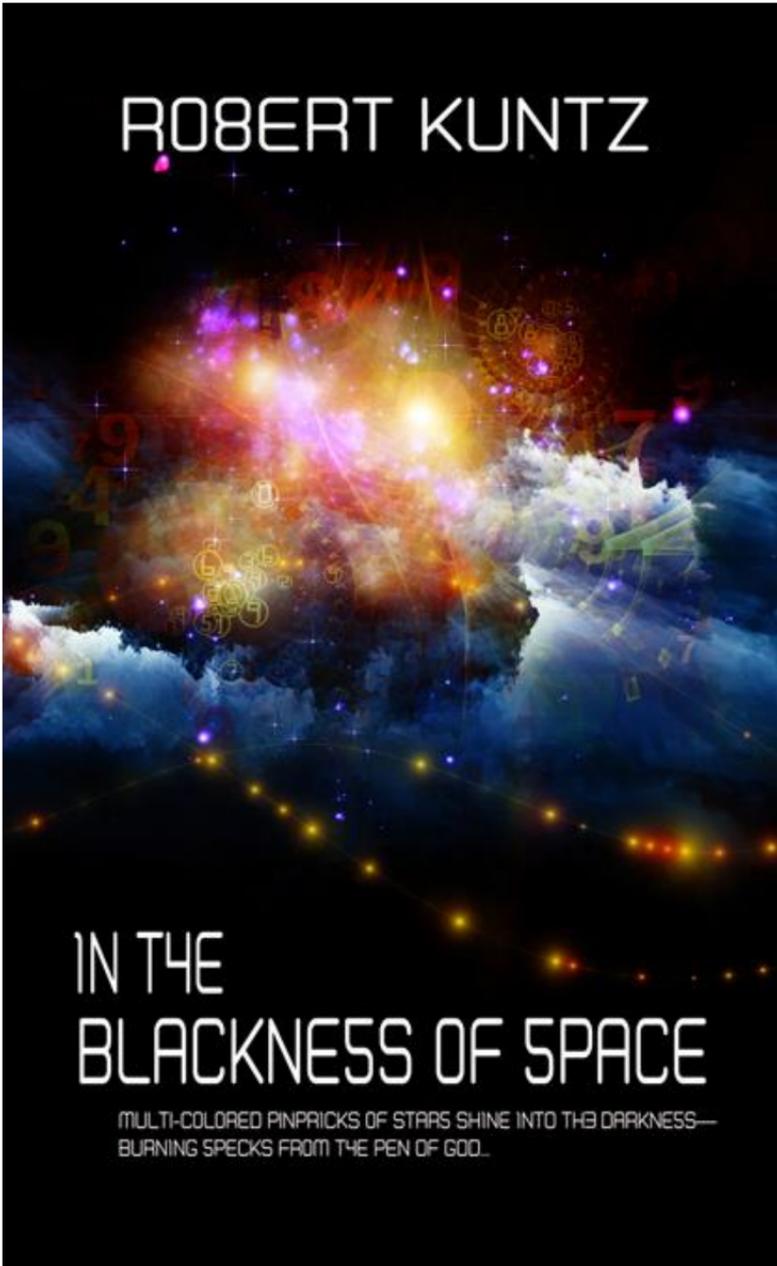


ROBERT KUNTZ



IN THE
BLACKNESS OF SPACE

MULTI-COLORED PINPRICKS OF STARS SHINE INTO THE DARKNESS—
BURNING SPECKS FROM THE PEN OF GOD.

IN THE
BLACKNESS
OF SPACE

Robert D. Kuntz

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IN THE BLACKNESS OF SPACE

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Dedication

The first book was always going to be for Libby.
Without a loving and supportive wife,
there is no story.

Acknowledgments

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Thanks to Mom and Dad. You raised me to be a reader and to dream.

1

Houston, Texas, January 4, 2052 (Launch minus 15 days), 08:07 CST.

Billy Jepler's lips pursed in a mischievous grin. "If they begged you to join the *Galileo* crew," he repeated, "what would you ask for?"

Blackness charged the edges of my vision, blurring the walls of the diner. I felt the sweat coming. I hated blacking out in public. Taking slow, deep breaths, I forced myself to look across the table at him.

"Never." Somehow, the word escaped my clenched teeth. My voice rose, "I will never ride in a car. Or bike or bus or train. I'll *never* leave Earth." I took a long, steady breath, trying to quiet my pounding heart.

Billy was dressed in a black power suit. Even though he was overweight, with an unruly head of black hair, his serious persona had a sobering effect on people. You could joke with Billy Jepler, but you never bluffed, bullied, or blathered.

Billy waved his hands and then clicked his ballpoint pen a dozen times. "Grant, relax. I know your fears. Who met you ten years ago when you were a new PhD who'd walked over a thousand miles from Charleston to work here at NASA?"

My heart settled. I looked around the dimly-lit diner. The shades were pulled down, blocking the

small square windows in front. A ceiling fan turned lazy circles overhead. The only other customers were back by the kitchen.

A broad-shouldered man of inexhaustible energy, Billy had a boyish face with steel blue eyes. Plump like the donuts he was savoring, he reminded me of a throbbing number 8. I was like a tepid number 1, a bean pole with straight hair and a thin nose.

Billy pointed a beefy finger at me. "My question is not 'Would you go to FarSpace?' My question is 'If you had them over a barrel, what would you ask for?'" He glared at me, but then raised an eyebrow.

I grinned. As serious as Billy could be, he had a spirit of fun when it came to his friends. He knew how to bump me off the downward slide to blacking out. I took another slow breath. "An Elvis Presley record collection, a bassoon and electric guitar, a pair of kestrels, two poodles, and blueprints for Confederate naval vessels."

Billy nodded thoughtfully. "Things from the crew's two-hundred-pound packages...nothing for you."

"I'm not going!" Sweat soaked my forehead. I focused on my breathing. *Five seconds in, five seconds out. Slow seconds in, steady seconds out. Your feet are on the ground; you're OK.* I looked down at the ancient rust-colored linoleum, cracked and buckled like a Martian landscape.

I was surprised Billy had asked me to breakfast. Two days ago, Manny Weppeler, the computer specialist on the *Galileo's* crew, had a prolonged seizure during a launch simulation. He was in the hospital, on a ventilator, diagnosed with mission-disqualifying California encephalitis. Billy had to be going crazy to

find a replacement.

I'd known Jepler for ten years. He was the master of multi-tasking, working on dozens of projects at once. Billy's deals, cons, trades, and larceny had saved the program countless times. We had a vision to send people deep into space, to planets where humans might live. With the president-elect promising to end FarSpace on his first day in office, we had to launch in two weeks.

Billy leaned forward. "OK, you're not going. But, Grant, work with me here. You're the most knowledgeable person I know. It's not just that you can walk me into the ground with those sturdy legs. You can think me into the ground with that brilliant mind. You have a passion for what we're doing and you see the big picture, so I need to know." His voice was soft. "What changes would you make?"

We'd protected FarSpace from so many gnat-brained accusers that it was hard for me to criticize the program. "You won't tell anyone from outside?"

"Only Jean-li Neuwin, the VidNet reporter," he said sarcastically. "I have a mini-pod-corder in my shirt pocket, and I'll tell her the recommendations of Dr. Grant J. Chapman, the most anal computer genius in the FarSpace support crew." His ballpoint fired off another staccato burst. "Relax. Just tell me."

I picked up my orange and then peeled and sectioned it. The four sections without seeds I put on the right side of my plate. The six sections with seeds on the left. Using my fork, I pierced those with seeds and worked the seeds out. I lined up the fifteen seeds in three rows of five. They reminded me of pungent, miniature number 9s. "Whoever established those miserly weight restrictions doesn't have the

intelligence God gave kumquats. The nauts are risking their lives. They're the most important element in the whole mission. You don't send people on a twenty-five-year trip into space and deny them two-hundred pounds of personal gear. If you're loyal to your people, you let them take the stuff of their dreams.

"Let Naomi Branch take her kestrels. She's raised them since they hatched. Let Carmen Pioquinto have her Elvis record collection, electric guitar, and bassoon. Let Ushamla Beduee take her rose bushes, bee hives, and those maddening mazes she sends bees through. Let Ihor Dremenev take his poodles and Bronson Gwen his naval blueprints. They'll be in space for years. Give them what will keep them sane."

I ate an orange section from the left. The taste reminded me of my walk to Houston. On the way through Louisiana, the road went past an orange grove. I helped myself to an orange, and as I ate each section, I slipped the seeds into my pocket. With the fifteen seeds on my plate, I now had 177,215 orange seeds, 3,988 peach pits, 5,735 cherry pits, plus apple seeds.

"You are an amazing man," Billy said. "At most, you talk with the *Galileo's* crew ten minutes a month. Yet you know their hobbies and interests because you care about them."

I shrugged.

Billy clicked his ballpoint as if he were trying to wear it out. "But you have to be realistic, Grant. You can't add kestrels, bees, and poodles. They'd breathe oxygen and eat food the crew needs."

I looked up from the seeds. "You don't understand it, do you?"

Billy grinned. "You're the science geek, not me."

“Look, Billy, the *Galileo*’s going on a twenty-five-year trip. In 1980, a pair of researchers estimated that every year a person eats three times his weight in food, breathes in four times his weight in oxygen, and drinks eight times his weight in water. Multiply that by eight crew members and twenty-five years, and stocking the ship would require a grocery store the size of Rhode Island. You can’t send *that* to FarSpace. So the crew members have to raise their own food and recycle air and water. They need a complete ecosystem, one with functional redundancy. You can’t have your CO₂ scrubbing system inoperative when you’re out past Jupiter.”

Billy looked fondly at his last donut and nodded. “It’s more complicated than sending a farm into space.”

“Right. It’s not just growing crops. It’s recycling human and animal waste in a system that keeps humans, plants, and animals alive.

“The ship’s ecosystem is modeled on the Biosphere II experiments of the 1990s, taking nature’s interdependent life-enhancing systems into space. The living part of the *Galileo* is made up of two rings, each with seven distinct biomes, one after another like beads on a bracelet.

“There’s a small rainforest with a seventy-five-foot waterfall and trees that will reach one hundred feet.”

“The nauts need monkeys and macaws?”

“Neither of those made the cut. The rainforest’s tropical foliage, along with the plankton and coral reef in the ocean biome, recycles CO₂ back into oxygen so the nauts keep breathing.

“The next biome is a dual-pond, tree-lined savannah. The stream from the rainforest flows

through the savannah ponds and then twists through the smallest biome, the mangrove swamp. Then the stream flows into the tiny ocean. It's a 660,000-gallon sea with a living coral reef, a sliver of beach, and coconut palms."

Billy centered his donut on his plate. "I remember that. An ocean the size of an Olympic swimming pool."

"The next biome," I said, "is the fog desert with lizards and cacti, followed by the ag biome with pygmy goats, chickens, and crops including oats, rice, sweet potatoes, beans, and onions."

"And the last biome," Billy said, nodding, "has the rooms where the crew lives."

"More than rooms. It's got living quarters, machine shops, labs, med-bay, gym, and library. The nauts will have to fix the plumbing, monitor the health of the biomes, and repair farm bots when they're light years from Earth."

"OK, that's the *Galileo*."

"No. That's the first ring, half the *Galileo*. In order to have failsafe redundancy, they've built a second ring."

"With a second rainforest, ocean, and farm."

"If something goes awry nine light-years from home, you can't just pop over to the neighbor's for a dozen eggs to replenish your flock."

"I get it. Functional redundancy."

"Their lives depend on it."

I ate another orange section from the left and enjoyed the juice trickling down my throat. I thought again of the long walk from Charleston and the seeds I'd started collecting on the way. I now had seeds from five varieties of common apples: 2,701 Cortland, 409 Grimes Golden, 3,511 Jonathan, 1741 Melrose, and 122

Albemarle Pippen. I knew if I planted them, each one would grow its own new variety. Apple seeds were like that. But I kept them nonetheless.

Billy squinted his eyes nearly shut. "The rings are balanced ecosystems. And now *you've* got a problem. You want to add kestrels, bees, and poodles. That ruins the ecological balance. You'll kill the nauts."

"Not if you keep the Beta Ring attached to the ship."

"Take a third complete ecosystem?"

"Why not? Go beyond functional redundancy to failsafe redundancy."

"But the cost."

"Billy, you're not thinking. The Beta Ring is already in space. It's the base on which the *Galileo's* been built. It's been connected to the rings from the beginning. Construction crews lived there. Its animals and plants have supported human life for seven years. It will cost less to keep it in place than to disconnect it."

Billy held up a hand. "Calm down, Grant. You've convinced me. No need to wake Houston." He thought for a minute and then said, "So why do the engineers say the Beta Ring won't hold up to a twenty-five-year space flight?"

"You've been listening to Rennellson. He has the IQ of a flatworm and the guts of a paramecium. Yes, he's the head engineer. Yes, he's more vocal than anyone else. But guess who loses his job if the Beta Ring goes to FarSpace? Talk to other engineers—like Malloy and Granger on the rigging team. The Beta Ring was built to last 75 years. Take it along. Don't let the next administration put it in mothballs."

I ate another orange slice from the left.

"It's all about failsafe redundancy," Billy

muttered. "Back-up systems, 'spare' animals, and environment."

"It's all for the nauts. You do everything possible not only to keep them alive, but to give the nauts a life."

Billy lifted a finger. "Point one, no priority higher than the nauts." He looked at his donut and thrust out two fingers. "Point two, failsafe redundancy for every aspect of FarSpace." Suddenly his eyes got wide, and a gleeful look passed over his face, as though he'd discovered the key to donut heaven.

"Grant, you've sparked a breakthrough for me, solved a giant problem."

I didn't get it.

Billy leaned back in his seat, picked up his donut, and took a bite. He sighed and then chewed with a faint smile on his lips. He looked at me with steely eyes. "OK, you miracle worker. Tell me what you would take. What would keep you sane?"

I took a deep breath and looked at Billy's cherry red tie. "Plenty of people think I'm not sane. I won't get in a car..."

Billy clicked his pen furiously. "You have degrees in this stuff. Help me out here."

Billy's questions were bothering me. Sweat began to collect on the back of my neck. "I'm not going!"

My arms started to shake. If I didn't get out of this dingy place and into fresh air and sun, I'd black out. I stood from the table and glared at Billy. I'd only blacked out twice this month. First the sweat, then the shakes, and finally the system got so overloaded it shut down.

As I reached the door, I shouted back at him, "I believe in FarSpace, you know. We need a challenge

bigger than ourselves. If we bring back proof that planets are habitable, people will settle the stars.”

I shoved open the door and lurched out into the sunshine. In 1,714 steps, I reached Travis Park, a small patch of grassy lawn bordered by thick oak trees dangling with Spanish moss. The best antidote for blacking was anchoring myself in nature. If I could sit on the bench, curl my toes in the grass, and hear the birds’ joyful singing, the shakes and sweats would fade. I was managing. Even Dr. H said so.

For early January, the air was unusually hot and muggy, but the grass by the foot of the oak tree was like cool silk. A lively concert from the wrens poured from overhead. The little birds were musical number 67s, singing light into the sun.

It wasn’t like Billy to pressure me. We were friends. We went on long walks together. He told me things he didn’t tell anyone except his wife, Beth. At NASA, Billy was a trouble-shooter. He fixed snarls, bottlenecks, logjams, and complete impossibilities. Billy coaxed and conned, bargained and bartered, swapped and swindled, until he got what we needed.

Something was nagging me about Billy. I forced it out of my mind and looked out over the park, watching dogs tug on their leashes and squirrels tease them. At 8:52, my watch alarm beeped. I shut it off and headed to Dr. Hudson’s. Everyone on the FarSpace project meets with a shrink, even the bigs.

My regular appointment wasn’t for two weeks. But Dr. H’s secretary had called me the day before, asking if I could switch. She’d given me directions to the new office.

I liked Dr. H. He had gentle green eyes that lit up when he saw you. Even when he challenged me, I

knew that he understood me. "Grant," he'd said last time, "you're a problem solver. You're open; you let the solution come."

That was how I felt about smoothing code. In the zone, solutions come.

08:59 CST.

The door was open when I arrived at Dr. H's new office. The place was a small box, no windows, no room for a desk. Two beige upholstered chairs filled the room. Dr. H was sitting in one of them, and he nodded that I should take the other.

He was a short, energetic man. His face was like a number 4, full of sharp angles. His fingers were long 6s, stretched into gentle curls. When he was listening intently, he'd squint one eye and bob his head forward.

This new office had pictures on the walls: a white Texas longhorn lounging in a meadow of bluebells, a craggy mountain range of snow-covered peaks, a rough-hewn sailboat on a smooth river that I imagined was the Nile, and a mist-covered pond at sunrise. If he couldn't have windows, at least he could have something to look at.

"Doc, how'd you get exiled to a closet?"

"This is temporary." He smiled warmly, leaned back in his chair, and clasped his hands behind his head. "I wish you were in charge, Grant. You'd change things that need to be changed."

"Not me."

"You sell yourself short. You could run this whole place. You know how to focus on the problem and come up with the best solution."

Dr. H had never said anything like that before.

"Billy said you had another date with Marsha."

I smiled at the memory. "Our fifth."

Dr. H grinned at me and I went on, "She's smart and interesting. She's not one of those people who fuss over things." I thought for a moment. "She has this wavy red hair that sways like a dancer as she walks. She's a gentle person and kind. I think she likes me. We talk for hours and she's not upset by my phobias."

"Doc, last night on our date, she just sang. We were walking by the park, and she just started singing. A happy song, one I didn't know. I've never been with someone who did that, but I liked it. She's a 3³, Doc."

"Grant, what do you think will come from these dates?"

I felt uncomfortable with the question. "I really like her, Doc. When she smiles, her mouth twitches on the right side, like she's winking at you. But she wouldn't want me. I'm damaged goods."

"She's gone on five dates with you and she doesn't want you?"

"Doc, who would marry someone with my phobias?"

"Tell me this, Grant. If there was someone who would marry you and love you, what would she be like?"

Now I was even more uncomfortable. I shifted in my chair. "It would be someone like her. Someone who listens and cares and who's not a quitter."

"Think about it, Grant."

A sober look crossed Dr. H's face. "You know I'd never lie to you. I need to interview you today in a way that won't be comfortable for you."

"OK."

"Tell me the first time you were afraid of heights or moving things."

I clenched the arms of my chair. I hated talking about this. Dr. H waited, his head tilted to the side.

Finally, I forced out the words. "It was my fifth birthday. My dad put me up in a tree. He left me there five hours."

Suddenly, I couldn't say anything. My mouth wouldn't work. My brain couldn't figure out how to speak. *Deep breath, buddy. Five seconds in and five seconds out. Slow and steady. Your feet are on the ground.*

Dr. H sat patiently. I saw a glistering in his eye and felt warmth spread through me.

Something broke loose inside. "He was drunk and probably high, and he got mad because I'd thrown a stick and scratched his car. He grabbed me, threw me in the back of the car, and screeched down the block to the park. He yanked me from the car and shoved me up a tree. 'I'm leaving you here, you reckless little brat,' he screamed. 'I hope you fall and break your neck. You climb down before I come back and I *will* break your neck.'"

I took deep breaths. *He's not here. There's no tree. It's not going to happen. Five seconds in, five seconds out.*

"How long did he treat you like this?"

"Three years, eleven months, and one day."

"How often?"

I squeezed the arms of the chair. There was no often about it. I never knew when he would explode from the haze of drunken highs. I tried to stay out of his sight.

"Grant, how often?"

"I don't remember. I'm not sure if once he left me up there overnight or if two or three times blurred into

one.”

“Not how many times. How often?”

“Ten to fifteen times a week. When I got too big for the tree, he’d lock me in a closet or shove me in the trunk of the car. He’d scream at me, ‘If I die and don’t come back for you, it’s all your fault.’” I winced from the memory of his voice and felt the blackness looming, squeezing me like I was squeezing the chair. I took deep breaths. Letting go of the chair arms, I slid my fingers onto my pulse. The steady thumping of life soothed me.

“It always felt like the first time, when I was up in the tree. I was afraid I would fall and break my neck. I was afraid he’d forget me and never come back, that he’d die and never come back.”

I shivered, focused on my pulse, and took deep steady breaths. “Twenty-nine days before my ninth birthday, I came home from school and found Mom and Dad dead on the living room sofa. They’d OD’d. The state made Aunt Clara and Uncle Ralph take me.”

“When you’re afraid, what helps you feel better?”

“My feet on the ground. Being out of doors. Hearing the birds sing and dogs bark. I love the sounds the wind makes, brushing the tall grasses, rustling through the trees, whisking papers along the street.”

“If we gave you a sedative and you couldn’t feel or see anything and you came to on the FarSpace *Galileo*, what would happen?”

In an instant, I was soaked with sweat. Uncontrollable shivers wrenched my arms and legs. *Deep breaths. Five seconds in...* I shut out everything but the steady pulse. I counted a lot of things, but I didn’t count my pulse, just felt the consistent, comforting throb. Self-soothing, they call it. It helps me manage.