THE END OF GRAVITY

A Story for the Screen

THIRTY-EIGHTthousand feet above the northern polar ice, Norman Roth dreams about floating.

He is four, perhaps five years old, and his father is teaching him how to swim in the ocean near their summer rental cottage on Long Island. Roth lies on his back in the salty water and forces himself to relax in the firm cradle of his father's arms. The waves break against the shore and the boy forces his nervous breathing to match the cadence of the surf. "Relax," says his father. "Just float. Let the ocean do the work. I'm going to let go."

His father releases him, keeping his arms ready to support the child if he goes under. He does not go under. The small boy floats, rising and dropping on the long waves, eyes fiercely closed, skinny arms firmly extended, skinny legs wide on the water. Eyes still closed, the child smiles in terror and joy. The noise of the surf is very loud.

Roth opens his eyes. The sound of the surf becomes the sound of the air moving through the ventilator in the darkened first-class cabin of the747 and Norman Roth is no longer a child, but a tired, middle-aged man. He rubs his eyes, adjusts the ventilator above him, and closes his eyes again.

A darkened hospital room. Roth, apparently the same age as on the plane, is sitting next to his father's deathbed in the darkest hours of the night. The old man has been in a coma for days now. Exhausted, alone in the dark, Roth listens to his father's labored breathing—not so different from the sound of the surf sliding onto the long-forgotten Long Island beach. Roth glances at his watch in the dim light.

Suddenly his father sits straight up in bed. The old man's eyes are open and staring at something beyond the foot of the bed. His gaze is not frightened, but interested—very, very interested.

Startled, Roth leans closer and puts his arm around the older man's cancer-sharpened shoulders. "Dad?"

His father ignores him and continues to stare. Slowly, his father's right arm comes up and he points at something beyond the foot of the bed.

Roth looks. There is nothing there. The sound of the surf is very loud.

ROTHis met at Moscow's Sheremetyevo Airport by an attractive woman who identifies herself as Dr. Vasilisa Ivanova, his liaison and interpreter during his stay. In the middle of shaking hands, she sees his expression freeze. "Is there something wrong, Mr. Roth?"

"No, no . . . nothing. It's just that you remind me of someone." Roth has never said that to a woman.

Vasilisa smiles dubiously.

"You remind me strongly of someone but I can't think of who," continues Roth with a rueful smile. "Jet lag, perhaps. Or just age."

“Perhaps,” says Vasilisa. “At any rate, it is an honor to have such an esteemed author to visit and write about our program. The winner of the American Pulitzer Prize and someone who came close to winning the Nobel Prize in Literature. We are honored.”

“Close only counts in horseshoes and hand grenades,” Roth says tiredly.

“Pardon me?”

“A stupid American idiom,” says Roth. “Your English is excellent. Are you from Energia or the Russian Space Agency’s public relations?”

It is Vasilisa’s turn to smile without humor. “Actually, I was a flight surgeon at TsUP. AfterMir was brought down the number of surgeons was reduced in the Russian Space Agency and I moved to administration rather than be forced to leave the program. I volunteered for this chance to show you around.”

“Soup?” says Roth.

“TsUP,” she says, explaining the acronym for the Russian Space Agency’s mission control center.

They come out into the blowing snow where a Mercedes and driver wait for them.

“You have been to Russia before, Mr. Roth?”

“Call me Norman. Yes, once. In the early eighties. For a literary conference.”

“It has changed to your eye?” asks Vasilisa as the car carries them out into traffic.

Roth looks at the traffic—so much more traffic than during his first visit almost twenty years ago, Mercedeses and other foreign luxury cars cutting each other off in the high-speed lanes—and then looks beyond the highway at the Stalinist apartment buildings and frozen fields and abandoned construction beyond. “Changed? Yes and no,” he says.

“We will go to the Hotel National and get you—how do you say it?—settled into your suite,” says Vasilisa as they approach the city. “You are tired? You would like to sleep?”

“I am tired, but I will not be able to sleep. It’s morning here. I’ll wait for tonight to try to get on a regular schedule.”

“Then perhaps you would like to see TsUP?”

“By all means,” says Roth. “Let’s see soup.”

ROTHin the brightly lighted office of his editor atThe New York Times Magazine.

“Norman, we’re excited about you doing this piece for the magazine, but I feel bad about asking you to spend your Christmas vacation in Moscow.”

Roth shrugs. “What do I know about Christmas vacations?”

“If it’s any consolation,” says feature editor Barney Koeppe, “you end the week with a big-deal New Year’s Eve party at one of the cosmonaut’s dachas. Everybody you need to talk to is going to be there. They say that Gorbachev is on the guest list.”

“Whoopee,” says Roth. “I’d like to know why you thought of me for this piece, Barney. I don’t give the slightest shit about the space program and I know even less. You’re sending a humanist and a Jew and an anti-business liberal and a technological illiterate into this den of post-marxist hyper-capitalist possibly anti-Semitic techno-weenies. Why?”

“Remember Mailer’s book about the moon landing—Of a Fire on the Moon?”

“Vaguely. That was thirty years ago.”

“Well, Mailer didn’t know a thing about the space program either, but he was a brilliant writer and the book was a brilliant piece of reportage.”

“Yeah,” says Roth, “but peoplecared about the moon landing. No one gives a damn about the International Space Station or the Russian Space Agency.”

“That’s why this piece is important, Norman. It’s time to see this space-exploration thing from a different angle—or give it up altogether. NASA’s funding is getting cut again and it’s reviewing everything, including Russia’s part in this space station project. Plus the Russians are sulkier than ever after they had to dumpMir into the ocean last year. Everybody’s pissed at everybody and now the Russian Space Agency is planning to send another paying space tourist up and NASA administrators have their panties in a bunch about it.”

“I can’t even remember the name of the first tourist the Russians sent up,” admits Roth.

“Denis Tito,” says the editor. “He paid twenty million bucks. One of your jobs is to find out how much this new guy is paying.”

“He’s also American?”

“Yeah. Some Wall Street wünderkind with a background in mathematics. The word is that he’s a few fries short of a Happy Meal—certifiably crazy. He wants to watch cloud tops the whole time he’s up there.”

Roth shrugs again. “Sounds like a good plan to me. It’s better than torturing fruit flies or whatever the hell the astronauts do up there.”

The editor puts his arm around Roth. “Are you all right, Norman?”

“Sure I’m all right. What do you mean?”

“I mean—first that long siege with your dad dying last month. And your bypass operation in August. I know from John that you haven’t been sleeping well for a long time, even before the heart surgery. I mean, this damned story isn’t worth killing yourself for.”

"I'm not volunteering to fly to the goddamned space station, Barney. I'm just getting paid to go to Russia to talk to the idiots who do."

THERussian Space Agency headquarters is a hulking mausoleum of a building in a northern suburb of Moscow. The Mercedes carrying Roth and Vasilisa bounces over deep potholes and has to skirt stretches of real chasms where roadwork has been started and then abandoned on the dreary sidestreet leading to the center.

The interior of TsUP is drafty, dank, labrynthine, echoing, and dark. Vasilisa explains that most of the lights are kept off to save money. The few technicians and administrators they pass in the wide hallways wear heavy sweaters or overcoats. As they enter the Mission Control room itself, two cats rush by Roth's legs.

"You allow cats in here?"

"How else to control the mice?" says Vasilisa.

Roth is introduced to flight directors, deputy flight directors, flight surgeons, ground controllers, cosmonauts, former cosmonauts, Energia executives, TsUP administrators, several chain-smoking engineers, and a janitor. No one, not even the janitor, spares Roth more than a few seconds for a cursory handshake before turning back to their conversations or cigarettes. No one seems to be working. On the largest screen against the far wall, a ground track shows the space station's slow progress around the Earth. It is over the South Pacific. There is a large model of the late, lamentedMir station atop one of the consoles. There is no model of the ISS.

"The American team is currently controlling the station from Houston's Mission Control," says Vasilisa. "TsUP was in charge of the first mission when there was only one module. Since the second and later modules were added, most of the space station operation is handled from Houston."

"What exactly do the Russian ground controllers do then?" asks Roth.

Vasilisa makes a graceful gesture with her hands. "Provide comm support. Plan for the nextSoyuz launch and Progress robot resupply mission. Communicate with the Russian cosmonaut onboard. Oversee some of the science experiments."

Roth looks at her and waits.

"We missMir, " Vasilisa says at last.

ASdawn approaches, Norman Roth lies in his chilly Moscow hotel room and dreams aboutMir.

He sees it as if from a deep-diving submersible approaching a sunken wreck, theTitanic perhaps. The water is black and the submersible's spotlights throw only thin beams through the cold currents, illuminating seaweed, schools of ugly fish, shifting silt. The only sound is the microphone-rasp of Roth's breathing. Suddenly there isMir looming out of the darkness. Transparent sea creatures float in front of the wreck's airlocks, its docking ports, its darkened solar panels.

Roth moves his submersible closer to the hulk, floating in past the damagedSpektr science module, drifting past theKvant module, pausing close to the core module where the cosmonauts and astronauts had lived and slept and eaten. There is a round porthole there and the submersible's beams illuminate it and stab into the darkness within.

A white face stares out. A young girl's face. The sound of Roth's breathing halts in shock. The girl opens her eyes. Suddenly there is a second face in the porthole, eyes staring but not at Roth—at something beyond. It is Roth's father.

Roth gasps awake in his hotel room, holding his chest.

THEflight south to Baikonur takes a little more than two hours in the Tupolev Tu-134 jet and there are only three passengers besides Dr. Vasilisa Ivanova and Norman Roth. He is surprised to learn that Russia's launch center is not in Russia, but in the nation of Kazakhstan, perched on the edge of the dying Aral Sea. His guide and interpreter explains that after the fall of the Soviet Union, Boris Yeltsin had been lucky to negotiate a lease for the isolated military base and adjacent city that had been the top-secret launch center and site of the USSR's space glories for more than three decades.

At first Vasilisa is reticent to talk about herself, but Roth draws her out. Her parents were academics: her mother a mathematician, her father a philosopher. She had earned her medical degree and then a doctorate in orbital mechanics at a very young age and been selected for the space program by one of the leading members of the Science Academy.

"You wanted to be a flight surgeon," says Roth.

"Ah, no, no," says Vasilisa. "From the time I am a child, I want to be a cosmonaut. But although I have my degree in space medicine, enter training, learn to pilot high-performance aircraft, achieve mastery at parachute school, it is not possible for me to fly in space. It is true that we Russians have sent only four doctors into space in forty years of flight, but still I might have had chance to fly toMir or International Space Station except for one fact. This is that I cannot urinate—is this the right word, Mr. Roth?—I cannot urinate on wheel of bus."

Roth looks at her, trying to divine the joke.

Vasilisa makes the graceful shrugging gesture with her hands again. "This is true. It is a metaphor, but true. You see, when cosmonauts fly in space, toMir, inSoyuz, on any mission, there is a big send-off—is this the right word? Yes? A big send-off outside the hangar where they get into their space suits. A general makes speeches. Technicians and reporters cheer. Then the astronauts board the transfer bus for the ride to the launch pad."

"Yes," says Roth, "I think it works pretty much the same at Cape Canaveral, minus the general's speeches."

Vasilisa nods. "Well, after the big ceremony, the reporters and VIPs jump into one bus and drive to launch pad to have more celebration when cosmonauts arrive, but the cosmonauts' transfer bus, it stops halfway and

all cosmonauts step out and piss—this is correct vulgar slang for urinate, yes? They all fumble in space suits and then piss on right rear tire of bus."

"Why?" asks Roth. The Tu-134 is banking over the Aral Sea and beginning its descent toward Baikonur. "Some sort of superstition?"

"Yes, precisely," says Vasilisa. "Our annointed saint of space, Yuri Gagarin, did this back in 1961 before world's first orbital flight, and all cosmonauts must do same before launch."

"But there have been female cosmonauts."

Vasilisa makes that graceful gesture with her hands. "Yes. There have been three Russian women in space—Valentina Tereshkova in 1963, Svetlana Savitskaya who flew twice to theSalyut station in the 1980s, Elena Kondakova who was flight engineer onMir in 1994 and who flew later on your shuttle."

"Three women in more than forty years," says Roth. "I wonder how many women we Americans have launched . . ."

"Thirty-two," Vasilisa says quickly. "Including Eileen Collins, who commanded the shuttle. No Russian woman has ever been command pilot on mission. Tereshkova, the first, was sent up in space so that she could be . . . bred, I think is right word . . . with male cosmonaut so Soviet space officials could see the effects of cosmic radiation on offspring. She could not even fly an airplane, much less a spacecraft. She was just biological payload."

"But the other two Russian women must have played a more active role," says Roth, smiling despite himself.

Vasilisa smiles sadly. "Have you, perhaps, read Valentin Lebedev's book,Diary of a Cosmonaut ? Lebedev was commander of 1982 mission toSalyut space station where Svetlana Savitskaya was flight engineer."

"Ah, no," says Roth, still smiling. "That book is on my nightstand, but I haven't got to it yet."

Vasilisa nods, missing Roth's mild attempt at irony. "Commander Lebedev wrote—'After a communication session we invited Flight Engineer Savitskaya to the heavily laden table. We gave Sveta a blue floral print apron and told her, " 'Look, Sveta, even though you are a pilot and cosmonaut, you are still a woman first. Would you please do us the honor of being our hostess tonight?' "

"Ouch," says Roth.

"What does this mean," says Vasilisa. " 'Ouch'?"

"It means something is painful."

She nods. "Perhaps I am sounding too much like American feminist. What would American female astronaut do if American male astronaut gave her a floral print apron in space shuttle or space station?"

"Punch him in the nose," says Roth.

"In zero-gravity, this punch would be . . . an interesting problem in Newtonian action-reaction ballistics," says Vasilisa. "But yes, this is a difference between American and Russian women. We Russian women do not like feminism so much here. But then we Russian women also do not fly so much in space here."

"What about this last woman cosmonaut you mentioned—Kondakova? You say she went toMir. "

"Yes," says Vasilisa. "After she was Flight Director Valery Rumin's secretary and then his wife."

"Ouch."

"This ouch, it is a very useful word," notes Vasilisa.

Roth nods and rubs his tired eyes. The Tu-134 pilot is announcing in laconic Russian that tray tables and seatbacks should be in a full, upright position. Or so Roth guesses. For all he knows, the pilot might be announcing that both wings have just fallen off. To Vasilisa he says, "You're saying that there's a sexist Old Boy Network here that made it impossible for you to become a cosmonaut."

"Yes," says Vasilisa, pulling her hair back over her right ear in a gesture that Roth is beginning to grow familiar with. "I am saying that about Old Boy Network. All cosmonauts are old boys. And I am also saying that I wish I could urinate on tire of bus while wearing space suit."

BAIKONURSpace City and launch center—Vasilisa explains that the worker's city adjoining the missile base is still called Leninsk by most Russians despite its official renaming and that the actual Baikonur was a farming village more than a hundred and fifty kilometers northeast, a typical Cold War ruse by Khrushchev, Vasilisa explains further, to tell the world that the USSR was building a rocket base on the outskirts of Baikonur and then go nowhere near Baikonur. Pre-spy-satellite strategy of misdirection from 1955.

Roth's first impression is that whatever their names are, both base and city are cold, desolate places, unsheltered by trees or hills from the wind that blows across a thousand kilometers of steppe. The city itself seems strangely empty, its apartment buildings dark, its streets largely devoid of traffic. When Roth comments on the brownish-red powder that is blowing across vacant lots with the spindrift, Vasilisa explains that this is dust blown from the frozen shores of the Aral Sea, dust rife with the pesticide that has killed the sea and its life.

"The inhabitants and workers of Leninsk think that the dust is killing them and their children," she says.

"Is it?" asks Roth.

"I think, yes."

The launch center itself strikes Roth as much more of a military base than

had been his impression of the Kennedy Space Center during his one visit there years before. Actually, the Cape Canaveral complex had made Roth think more of Disney World—a tourist attraction complete with audio-animatronic mannequins standing in for long-departed flight controllers in some of the rebuilt blockhouses—than of a serious spaceport. Baikonur is no-nonsense and real enough, but it is also depressing in a frozen, ninth-circle-of-hell sort of way.

Guards escort them from the well-guarded gate to a Russian major's office. The major shakes Roth's hand, speaks rapidly to Vasilisa in Russian—Roth discovers that the officer speaks no English—and then conducts them down to an unheated sedan and they take a whirlwind tour of the complex. An enlisted man drives. The major sits up front and continues a running narrative which Roth—sitting in the back with Vasilisa—hears only fragments of in translation. There are many statistics and at first Roth attempts to make notes in his little notebook, but he can't keep up—the major does not pause for questions—and eventually Roth puts away the notebook and watches the progession of hangars, administrative buildings, grim barracks, and aging launch pads with cracking concrete and rusted metal gantries. Roth is surprised to see piles of junk—space junk—piled here and there in empty lots between the buildings and alongside the streets: old fuel tanks, payload shrouds, and large rocket sections that Vasilisa explains were stages of the oldN-1 moon rockets. Even the rail lines that run to the cracked-concrete launch aprons are coated with a thick layer of rust.

They pull up to a building which Vasilisa tells him is the Hotel Cosmonaut where theMir andSalyut crews used to stay immediately before a flight. The car parks, the enlisted man holds the door, and they walk into the building behind the major in his forest-green military greatcoat. Cold wind whistles through the cracks around the windows in the empty lounge on the first floor. The major shows them a medical center that reminds Roth of the little infirmary he'd spent a week recovering from diphtheria in at Harvard too many decades ago. Finally they reach a second-floor lounge that seems to be their destination. The walls are covered with photographs of serious men with five-o'clock shadow—cosmonauts all, Vasilisa explains—but it is not the photographs that the major has brought them here to see.

Both sides of the door, from floor to ceiling, are covered with signatures in felt-tip pen. Roth stares at the Cyrillic scrawls and tries to look interested. The major speaks in reverent tones. Vasilisa translates some of the cosmonaut names. Roth has never heard of any of them, but he dutifully lifts his little digital camera, snaps a few pictures, and nods. The major also nods, they return to the car, drive to the administration building, and the tour is over.

The enlisted man is driving them to the gate when Vasilisa says, "Would you like to see anything else? As a TsUP administrator I am allowed to show you a few things on the base. What do you need to see, Mr. Roth? Norman?"

"A philosopher, I think," says Roth.

Vasilisa looks at him quizzically. "A philosopher?"

“I’m trying to understand the reasons behind all this,” says Roth, sweeping his hand toward the complex of pads, hangars, engineering centers, railroads, runways, snowy fields, and dormitories. “Not the space-race reasons. Not the national reasons. Not even the cosmonauts’ reasons—but thehuman reasons. I think I’ll need a philosopher even to come close to understanding.”

“A philosopher,” repeats Vasilisa. Then she smiles.

THEold man is in his seventies, Roth thinks, and he lives in a single supply room in the basement of a bunker under the shattered concrete of an abandoned launch pad.

The room is windowless and heated by a jury-rigged kerosene heater that also serves as the old man’s stove. There are hundreds of books lining the walls. A section of fuel tank has been hammered into a table; the chairs are modified cosmonaut couches from oldSoyuz capsules; a radio cobbled together from spare electronic parts sits on a metal workbench and plays classical music.

The old man’s face and arms have been badly burned, one ear is shapeless and he has no hair except for the gray stubble on his scarred cheeks, but the scar tissue is old and integrated into the wrinkles and lines of age. He is missing more teeth than he has kept, but he smiles repeatedly during introductions and while pouring vodka for his guests.

The old man’s name is Viktor but Vasilisa—whom he refers to as his “Firebird princess” while patting her cheeks—explains that for decades he has been known asNichevo. Roth is surprised by the nickname because he remembers this word from his visit to the Soviet Union almost twenty years earlier; meaning, literally, “nothing,”nichevo summed up a national attitude then that suggested “never mind” and “there’s nothing to be done” and “leave me alone.” The day that Roth had shown up at the airport years ago to fly home he’d found that there were no flights leaving that afternoon. The ticket agency and airline and the Writers’ Union had issued him a ticket for the wrong day. “Nichevo” had been the only comment from the airline people.

Now this elderly Nichevo pours vodka for all three of them. Roth has been ordered by his heart surgeon to avoid all alcohol, but he knows that seemingly every social interaction in Russia is lubricated by vodka, so he drinks two glasses before the conversation can start.

The old man’s voice is thick, fluid, gentle, and Vasilisa’s soft, simultaneous translation becomes part of the warm glow from the kerosene heater and the vodka:

“You wonder perhaps about these scars,” says Nichevo, holding up his welted hands to touch his face and neck and melted ear. “I received these a few hundred meters from here in October of 1960. I was thirty-two years old and working for the glory of therodina under the leadership of Premiere Khrushchev and under the command of Marshal Mitrofan Nedelin and through the brilliance of Chief Designer Korolev.

“Today I am a janitor . . . no, less than a janitor, a scavenger and

scrapmonger for Energia . . . but then I was a sergeant in the Rocket Forces and a technician. Itwas a glorious time . . . no, do not smile, my darling Vasilisa . . . it was aglorious time. Does your American writer friend know our phraseNasha lusche ? 'Ours is the best.' Well, ours was the best then, it is true. We were the first to launch an Earth satellite in 1957. The first to send a probe around the moon and to photograph the mysterious back side, yes? The first to orbit a dog. The first to orbit a man. The first to orbit a woman. The first to land on Mars. The first to land on Venus. The first to walk in space. The first to put up a space station—the oldSalyut stations, beforeMir, my darling—and the first to keep a manned presence in space for months, foryears !

"But the scars. Yes, I promised to tell of the scars.

"It was October, 1960, and the Chief Designer had produced a huge rocket—a monster of a rocket—that was designed to go to Mars, to take a payload to Mars, to send a piece of the USSR to Mars, even before a man had ever flown in Earth orbit. Liquid fuel. Many stages. Huge motors. The VIPs arrived from the Politburo and from the Red Army. The countdown was exciting, as all countdowns are . . . seven, six, five, four, three, two, one . . . and then . . . nothing.

"The rocket did not ignite. The Chief Designer conferred with the engineers. The engineers conferred with the technicians. The technicians conferred with God. It was decided by the generals that the rocket was safe but that it must be defueled and broken down and the problem fixed and prepared later for launch.

"The conscripts and the technicians refused to return to the pad. I did not refuse, but my peers refused. They thought the rocket would blow up during the tricky defueling. I thought they were cowards. So did the Chief Designer and the generals. To show that it was safe, Marshal Nedelin ordered that folding chairs be set up on the launch pad itself, in the shadow of the Mars rocket. The Marshal himself, along with his fellow generals and rocket engineers and administrators—all but the Chief Designer who was too busy—went and sat in the folding chairs by the fins of the tall rocket. It was my job to ferry the van back and forth from the blockhouse, bringing these dozens of important people to the pad so that the technicians and workers would see that there was no danger and return to their job. Which they did. The ground crew returned to their pumps and to their stations and to their work, defueling the gigantic rocket, pumping the nitrous oxide and hypergolic fuels into holding tanks.

"It exploded, of course. If you Americans had had the spy satellites above us then that you have today, you would have thought an atomic bomb had gone off. Marshal Nedelin and the generals and 160 others died instantly, vaporized, reduced to something less than ashes, lifted into the atmosphere like fire, like plasma, like smoke, like a vapor of souls.

"I was less than half a kilometer away, driving a van, driving toward the rocket, carrying the last gaggle of VIPs to their folding chairs, to their death chairs at the pad. The explosion drove the glass of the windshield into my face and then melted the glass and blew the bus off the access road into a holding pond and then vaporized much of the water of the pond into steam

and melted the tires and killed most of the people on my bus.”

Nichevo smiles, showing his few remaining teeth, and pours more vodka for them all. They drink. He continues:

“But six months later, my darling Vasilisa, in April of 1961, we launched Comrade Gagarin into space from a pad still burned by that blast and we have never looked back—we have had human beings in space, or waiting to go into space, ever since that April day.

“Now, darling Vasilisa, your American friend looks likeun maladietz —‘a good boy.’ “

Roth smiles at being called a boy.

“Tell him that we may now talkdusha-dushe, ” adds Nichevo.

Because Vasilisa has not interpreted the phrase, Roth asks her to clarify it.

She tucks her hair behind her ear in that gesture Roth has grown to love. “Dusha-dushe,” she says, “means heart to heart. We also sometimes saypo-dusham —soul to soul.”

Nichevo nods and smiles and pours them each another glass of vodka.

* * *

Roth is calmly drunk on the flight back to Moscow. He looks at Vasilisa illuminated by moonlight through the aircraft window and he thinks about what the old man had said.

His question to Nichevo had been: “Why do humans go up there? What’s waiting for us in space? Other than greed, glory, adventure and nationalism, why go?”

Vasilisa had interpreted slowly, carefully, obviously taking care in transferring the meaning of Roth’s question.

Nichevo had nodded and poured more vodka.

“All the reasons we go are not the reason we must go,” said the old man. “Things are ending here. We must go.”

“What is ending here?” asked Roth, worried that the old man would give him some nonsense about the Earth’s environment being used up, of humans having to find a new planet. Bullshit like that.

Nichevo had shrugged with his hands in a motion not dissimilar from Vasilisa’s.

“We came from the sea to the land but have been stranded on land for too long. We dream of the sea. We have memories of our new sea, of floating, of true freedom, of who we were before we were exiled to dust. We are ready to return to the sea.”

“To the sea?” repeated Roth, wondering if the old man was more drunk than he looked. Or senile.

Nichevo raised a hand palm up toward the roof of his bunker. “The greater sea. The true ocean of the cosmos. The childhood of man is ended here . . . the small nations, the small wars, the small hatreds, the small dictators, the small freedoms . . . all ended.”

Nichevo smiled. “There will be nations and wars and hatreds and dictators and freedoms there . . . up there . . . but larger. Much larger. Everything will be greater when our species enters this new sea, never to return.”

“What do you mean ‘we have memories’?” asked Roth. “How can we have memories of a place most of us have never been? Will never be?”

“The cosmos, the universe of no gravity beyond our slim, heavy shoal of stone, is the truerodina, ” said Nichevo, not smiling now. “The real Motherland. The USSR is a sad memory, but ourrodina lives within us. Just as the memory of therodina of the cosmos persists—we dream of floating in the womb, of our mother’s heartbeat surrounding us, of the freedom before birth and perhaps after death. Our species waits to swim in this new sea.”

Nichevo gestured upward again.

“It is all there, this new sea, the ocean cosmos. A few have crossed the beach of flame and terror and swum in it . . . a few have drowned on the way to it or upon the return from it . . . but most have returned safely. Safe but mute. We have sent no poets. No artists. No philosophers.” He smiled again. “No . . . scrapmongers.” The smile faded. “But we must feed our seas.”

“Feed our seas?” asked Vasilisa, translating her question for Roth.

“Feed our seas,” repeated the old man. “When the first man and woman of our race is buried in this new sea of the cosmos, then we can say that we have come home, home to our newrodina. ”

They had thanked him, Vasilisa had hugged him, and they moved to the corridor of the bunker, late for their flight home. Roth himself thanked the old man repeatedly, using the little Russian he knew.

“It is nothing,” said the old man, waving good-bye with his burned and scarred fingers.“Nichevo.”

“I know who you remind me of now,” Roth tells Vasilisa the next morning at breakfast.

That night his chest had pained him from the travel and vodka and tension and he had awakened from a dream, gasping and reaching for his nitroglycerine tablets, wondering if this was the hour when his heart would stop forever. It had not. But in the shock of his awakening, he had remembered his dream, his dream-memory, and in the morning he tells it to Vasilisa.

* * *

When Norman Roth is eleven years old, his family rents—as they had rented every summer since his birth—a small cottage on the quiet side of Long Island. It is a middle-class Jewish summer community and the boy

has always played alone there in the surf, but this year the neighboring cottage had been rented by a new family—the Klugmans—and they have a twelve-year-old girl.

Normally young Norman would ignore a girl, but none of the other guys are around here on the island and he is lonely, so he spends his days with her—with Sarah—at first grudgingly and then with the anticipation of real friendship.

Boy and girl, just on the cusp of puberty for her, a few years away for him, playing together in faded swimsuits and shorts, swimming together, bicycling together, hunting shells together, sailing together on the smallSunbird boat Norman's father lets them use, going to movies at the small village theater together, drawing in empty boathouses together on rainy days, lying in the dunes and watching the stars together on the nights the sky is clear. The swimming raft twenty meters out from the beach is their meeting place and their clubhouse and their summer home together.

By the middle of August, with the school year looming like a dark cloud just rising above the horizon, Norman and Sarah are inseparable.

On the beach that last night before both families head back to their respective cities, their disparate neighborhoods, their different and separate schools, Sarah takes Norman's hands in hers and they kneel together on the cool sand. The moon is full above the lighthouse. The surf makes soft lapping noises. The cowbells on small boats and the deeper bells on channel buoys ring and clank to the shifting of the waves.

She kisses him. He is so surprised that he can only stare. She takes his face in her wave-cool hands and kisses him again.

Serious, not laughing, she stands and wiggles out of her sun-faded swimsuit. She turns—the twin stripes of white skin across her shoulder blades and backside glowing palely in the moonlight—and wades into the water and swims out toward the raft.

The boy hesitates only a second before standing and pulling off his swimsuit. The moon paints the uninterrupted smoothness of his skin. He swims to the raft.

Aboard the gently bobbing raft, they lie on their backs, feet in opposite directions, the crowns of their wet heads touching. As if floating above, the man, in memory, can see the nude boy and girl—he more child than she—her breast buds pale swellings in the moonlight, the glaring absence of her groin dusted with dark stipple.

The two do not talk for some time. Then the girl raises both arms, bends back her hands blindly, like a ballerina gesturing. The boy raises his arms over his own head, his eyes on the moon, and his fingers find hers and interlock.

"Next summer," she says, her voice barely audible above the surf.

"Next summer," he promises.

"MR. Roth," says Vasilisa at breakfast. "You are a romantic."

"If you have read my novels, or heard about my three ex-wives," says Roth, "you would know that I am not."

"I have read your novels," says Vasilisa. She smiles slightly. "And I have heard stories of your three ex-wives." After a moment she says, "If this childhood story were Russian, it would not have a happy ending."

"It does not," promises Roth.

He tells her about the boy's winter—the children have not exchanged addresses, have not promised to write, have decided to keep their friendship for the summer and the beach and the water—and he tells her about the months of waiting, the literally painful expectation that built to near insanity in the weeks and then days before the families were both scheduled to return to their summer cottages on the island.

The boy races to the Klugman cottage the minute he is released from the family station wagon. He pounds on the screen door. A strange woman comes to the door—not Sarah's mother.

"Ah, the Klugmans," says the woman. "They gave us their summer lease for this place. They had a tragedy this winter and will not be coming back to the cottage. Their daughter died of pneumonia."

"Very Russian," says Vasilisa. "But why do I remind you of this girl? Do I look like her?"

"Not at all," says Roth.

"Do I speak like her?"

"No."

"Is it that you imagine that Sarah would have become a doctor if she had lived? Or would have wanted to be a cosmonaut?"

"No. I don't know." Roth raises his hands in what he realizes is a clumsy imitation of Vasilisa's graceful shrug gesture.

When he sets his hand back on the breakfast table, Vasilisa reaches across and sets her hand on top of his.

"Then I understand," she says.

ONthe day before the big New Year's Eve party, two days before Roth's scheduled departure, they are driven an hour northeast of Moscow to the TsPK—the Gagarin Cosmonaut Training Center, home of the cosmonaut corps—which everyone at TsUP and NASA calls Star City.

"Norman," says Vasilisa as they leave the main highway and drive through a thick forest of pine and birch on an empty two-lane road, "I have read your books. They are very dark. One of our reviewers called your last book 'a Kabballa about death.' Perhaps that darkness is why your fiction has always been popular in Russia."

Roth laughs softly. “Maybe they like the books because they’re the life-statement of an atheist, Dr. Ivanova. I’m a Jew, but I’m an atheist. The novels are a scream at the heart of an insensate universe, nothing more.”

Vasilisa shakes her head. “The Soviet regime might have allowed them to be published because of the atheist sentiment, but they are more popular now than ever and Russia stinks of incense these days.”

Roth laughs again. “You’re not accusing me of being a closet sentimentalist, are you, Vasilisa? Or of harboring a hidden spirituality?”

“Sentimentalist, no. Spirituality, I think, yes.”

Roth only shakes his head and looks past the driver as they approach the main gate of Star City.

PASTthe guards and through the tall, silver gate, the forest continues and then opens onto a city square watched over by a large statue of Gagarin. Beyond the square, there rises a cluster of curiously American-looking townhouses—Vasilisa says that the American-looking townhouses are, indeed, American, built to house the astronauts who trained here forMir—and then they pass a humpbacked building holding the world’s largest centrifuge, glimpse the Avenue of Heroes (a strangely modest greenway, white with snow today, with no statues) and pull up to the Cosmonaut Museum.

Vasilisa points out parked cars with government plates with numbers from 1 to 125, indicating both the official numbers of their cosmonaut owners and the order in which that cosmonaut flew into space.

The driver holds the door while Roth and Vasilisa move quickly through the snow and into the dim museum, where they check their coats, glance up at a large mural of Yuri Gagarin, and climb a flight of stairs to the main Gagarin exhibit where a bust of the dead cosmonaut seems to stand guard over well-dusted cases of memorabilia. Vasilisa translates the various placards and captions, explaining that the last series of items had been taken from the wreckage of his aircraft on the day he had died, during a routine training mission, in March of 1968, seven years after his 108-minute orbital flight. Roth can see a burned photograph of Chief Designer Korolev, Gagarin’s burned wallet that had carried the photo, the cosmonaut’s singed driver’s license, even a vial of dirt and ashes from the wreckage.

“Don’t you think this is all a bit ghoulish?” asks Roth.

“I do not know this word, Norman—what is ‘ghoulish’?”

“Never mind.”

They move down the hall to a case holding the jumpsuits and photographs of the first three cosmonauts to live aboard the first Soviet space station—Salyut—in 1971.

“Salyutmeans ‘salute,’ doesn’t it?” asks Roth.

“Precisely.”

"Who or what was theSalyut station saluting?"

"Yuri Gagarin, of course."

Vasilisa reads the inscription next to the men's photographs. Cosmonauts Georgi Dobrovolskiy's, Vladislav Volkov's, and Viktor Patsayev's mission toSalyut had been wildly successful, their zero-gravity exploits and good humor broadcast to the Russian people every night via television. Their reentry into the atmosphere seemed uneventful, their landing on the Russian steppe according to plan except for an unexplained failure in radio communication. But when the recovery crews opened their capsule, all three cosmonauts were dead. A valve had broken during reentry, their air had rushed into space, and all three men had asphyxiated in their couches.

"We have fed our seas," says Vasilisa.

Roth shakes his head. "I think Nichevo meant that we must leave our dead there, in space, before the new sea is truly fed."

"Perhaps."

Beyond this exhibit is what appears to be an ordinary office but is actually a precise replica of Yuri Gagarin's office, just as he left it on the morning of his fateful flight on March 27, 1968. The hands of the clock are stopped at 10:31, the moment of impact. His day calendar lies open on his desk. Letters and memos lie unfinished.

Vasilisa points to the desk. "Each cosmonaut or crew of cosmonauts signs his name in that large brown book on the day of their flight into space," she says softly, whispering in this hallowed space. "Even our cosmonauts who fly to the International Space Station."

Roth glances at her. Vasilisa's eyes are brimming as she looks at the book. She catches him looking at her. "You think that I am sentimental, yes?"

"No," says Roth. "Spiritual."

ROTHdreams that he is aboard the International Space Station, floating in dim light. Another astronaut, a man, is sleeping, rigged in some sort of thin sleeping bag contraption that holds him seemingly upright, arms protruding and floating in front of him, wrists bent, fingers moving like seaweed in a current.

Roth is surprised how loud the ventilator fan is, how stark and functional and sharp-edged the interior of this module of the station is. The air smells vaguely of ozone and sweat and machine oil. He finds that he can move silently by kicking off some solid object and he floats head-first without even raising his arms, moving through a hatch into an adjoining module. There is a porthole here and Roth floats over to it and looks out. The Earth hangs above him, beyond the dark exclamation mark of a solar panel.

The station is approaching the sunrise terminator. The limb of the planet sharpens in a crescent of brilliant sunlight. For a second, Roth can see the thin line of atmosphere itself illuminated like a backlighted, inverted miniscus, then the sun clears the curve of the world and ignites thousands

of cloud tops above a dark sea.

Suddenly Roth realizes that he is having trouble breathing. The air is too thin. Whirling in microgravity, he realizes that he can hear a constant and ominous hissing, rising in pitch but descending in volume as the air thins further. The air is rushing out of the station module.

Gasping, Roth spins in space but he has pushed away from the bulkhead, is too far from anything solid, and he can only pinwheel his arms and legs without effect, tumbling in the thinning air and unable to swim his way to safety.

* * *

Roth awakes at the touch of a cool hand on his bare chest. He blinks away the after-images of the dream and looks around the hotel room. It is dark except for slivers of moonlight coming between the heavy curtains. Vasilisa, dressed only in Roth's extra pair of blue pajamas, sits on the edge of the bed, a stethoscope around her neck, her hand on Roth's chest.

"What?" He tries to sit up but she pushes him back with her surprisingly strong fingers.

The stethoscope is cold against his chest. Vasilisa sets the instrument on the nightstand but touches his chest again, running two fingers along the large cross-shaped scar on his bare chest, then reaching down to feel the long scar on his left leg where they had taken a vein during his last surgery.

"Do you remember dinner?" she says very softly. The clock says 3:28.

"No," whispers Roth, but then he does. They had been having a late dinner in the National dining room when the chest pains started. He had fumbled for his nitroglycerine tablet, held it under his tongue, but the usual instant relief had not come. Roth dimly remembers her helping him out of the cavernous dining room, holding him upright in the elevator, opening the door to his room for him, and then . . . confused images . . . the cool prick of a needle, a dim recollection of her slipping between the sheets next to him. "Ah, Christ," says Roth. "This isn't the way I would have chosen for us to go to bed together."

Vasilisa smiles and buttons his pajama shirt. "Nor I, Norman. I had considered transporting you to hospital, but I am sure this was just a severe episode of angina, not another heart attack. Your heart sounds good, your blood pressure stabilized, your pulse has been strong." She lifts the sheets and blanket and slips in next to him again. "I think you woke because you were having a nightmare."

He turns to look at her in the moonlight. "Just a dream." Then he remembers the terrible hiss of the oxygen rushing out of the space station. "A nightmare," he acknowledges. He looks at the glowing clock face again.

"It is New Year's Eve," whispers Vasilisa. "You know, I think, how important the holiday is in Russia—a combination of your Christmas and New Year's and other holidays as well."

“Yes.”

“You remember I said that my parents were academics—a philosopher and a research mathematician?”

“Yes.”

“But like most Russians, they were superstitious. My mother taught me the old custom of putting three slips of paper under my pillow on New Year’s Eve. One would read—Good Year. One would read—Bad Year. The last would read—Medium Year. After midnight, I would reach under the pillow and draw one.”

Roth smiles at this. He reaches across her to pick up the small notebook on the nightstand and his silver pen. The last filled page of the notebook is covered with notes about Gagarin’s office. He takes an empty page, tears it into three strips, and writes on the first scrap—Year with Vasilisa; on the second strip—Year without Vasilisa; the third he leaves blank.

“You tempt fate, Norman.”

Roth folds the three scraps and puts them under the pillow they now share. “You are superstitious, Dr. Ivanova.” He kisses her very slowly.

When the kiss is finished, she pulls her head back just far enough to be able to focus on his face. “No,” she whispers. “Spiritual.And sentimental.”

THENew Year’s Eve party is at cosmonaut Viktor Afanasiev’s dacha outside of Moscow. Vasilisa explains that Afanasiev was the last commander of a regularMir crew and that he had been the man who literally switched off the station’s lights on August 28, 1999.

“Viktor is a friend of mine,” she says. “He tells me that he has had strange dreams sinceMir deorbited.”

“What kind of dreams?” asks Roth.

Vasilisa opens her hands. “Dreams of encountering theMir station underwater, as if it was theTitanic or some other sunken ship from the past. Sometimes, Viktor says, he dreams that he sees the faces of dead people he has known looking out fromMir. ”

Roth, who has never told her of his own dream, can only turn and stare at her as they drive down the narrow road through the trees and the snow.

Roth and Vasilisa arrive early, fiveP.M. , but it is already dark and dozens of people are already there. Even though tables inside the spacious, beautifully decorated dacha are groaning with food—kielbasa, cheeses, vegetables and dip, slivers of fish, heaps of caviar, variouszakuski —hors d’oeuvres that leave no need for entrees—soups, salads, and strips of beef, all surrounded by countless bottles of vodka and champagne—Roth and Vasilisa find the cosmonaut host and friends outside by the barbecue, ignoring the temperature that Roth estimates to be at least ten degrees below zero Fahrenheit, grillingshashlyk —mutton shish kebabs—telling jokes, laughing in the cold air and drinking vodka.

In the next few hours, Roth will be introduced to more than a hundred people and he makes the typical American mistake of trying to remember first names rather than the first name plus patronymic that would have made some sense out of the avalanche of names and faces. Still, Roth sorts some of the people out—there is the cosmonaut Sergei and his wife Yelena; Tamara, the attractive Moscow psychic who had predicted the near-catastrophic problems on Vasily Tsibliyev'sMir mission (being specific to foretelling the day of the collision betweenMir and its supply rocket, according to Vasilisa); Viktor, the chain-smoking deputy flight director with white hair; flight engineer Pavel ("Pasha,") cosmonaut Aleksandr ("Sasha") and his wife Ludmilla and daughters Natasha and Yevgena; flight director Vladimir; TsUP psychologist Rotislav whom Vasilisa and others call "Steve"; the cosmonaut team of Yuri and Yuri; cosmonaut Vasily ("Vasya") and his wife Larissa; and so on and so forth.

In addition to the cosmonauts and their families and the TsUP flight controllers and directors, there are famous faces at the party—important Russian politicians, an American congressman whom Roth knows to be a complete asshole, several NASA people, two astronauts and a former astronaut (none with their wives but one with a Russian girlfriend), some Russian poets and writers (all of whom are blind drunk by the time Roth is introduced to them), a second psychic—not nearly as attractive as Tamara, the first psychic Roth had met—an American film director lobbying for a flight to the ISS, a Russian film producer who glowers a lot, a German film director who seems to know everyone at the party, a Russian actress who is staggeringly beautiful and amazingly stupid, and a dog with the most sympathetic eyes Roth has ever seen on a living creature.

A large plasma TV screen has been set up in the living room and images come in through the evening of preparations in Red Square for the New Year's celebration as well as CNN updates on revelry in China's Tiananmen Square and elsewhere.

Occasionally touching his aching chest—when Vasilisa is elsewhere or not looking—Roth wanders through the house and evening, carrying the same unconsummated glass of vodka, shaking hands, chatting with those people who speak English, listening to Vasilisa's whispered translation of songs and conversations.

The night grows darker and the party louder as the clocks crawl toward midnight.

THREEcosmonauts are on the glassed-in porch, arguing earnestly in Russian about the experience of launch and entering low-earth-orbit. Roth remembers Vasilisa's whispered capsule history of each of the men:

Anatoli Arstebarski had flown in space only once, a successful flight, before pursuing a more lucrative profession; Sergei Krikalev was perhaps the most successful cosmonaut now working, having flown onMir, the International Space Station, and on the shuttle; Viktor Afanasiev, their host this evening and the lastMir commander, is the man with the occasional bad dreams, the man whom Roth thinks of as the captain of the spaceTitanic. Roth holds his glass of vodka and listens to the deep male voices punctuated by Vasilisa's soft whisper as she rushes to interpret.

Anatoli: “It is like birth. There is the long wait, the claustrophobia, the darkness, the distantly heard noises—the gurgle of glycol pumps, the hum and tick of power units, the whisper of half-heard voices from the world without—and then the trauma, the pain of g-forces, the terrible vibration and sudden noise, followed by the entry into light and the cosmos.”

Sergei: “Nonsense. It is like sex. There is the long anticipation—sometimes so much more exciting than the real event. The foreplay—the endless, frustrating simulations. Then the preparation on the pad. The lying down on the form-fitting couches. The tease of the countdown. The pulse accelerating, the senses finely tuned. Then the explosion of release. An ejaculation of energy . . . thrust, thrust my friends. It is all about thrust. After the release and the straining and the cries aloud—oh, God . . . Go! Go! . . . there is the silence and the cool embrace of space. And then, as soon as it is finished, one wants it to start all over again.”

Viktor: “What total bullshit. Launch is like dying. Ignition is the casting free from the body, the separation of spirit from matter. We claw toward the fringes of atmosphere like a drowning man fighting his way to the surface of the sea, like a soul flying free from its burden of flesh. But once to this surface, we find only vacuum. Everything and everyone we know and have known or ever could know is left behind. All of life is abandoned for the cold, silent sterility of the cosmos beyond. When the engines shut down, the ordeal and pain over, the barrier between life and death has been breached, the spirit is become one with the cosmos, but lonely . . . oh, so lonely.”

The three cosmonauts are silent for a minute and then start laughing together. Viktor pours more vodka for everyone.

ROTH, standing alone in the suddenly vacated enclosed porch, sees an old man crossing the dacha’s snowy lawn in the moonlight. Seen through the rim of frost on the glass panes, the old man is more apparition than reality—white clothes, white hair, white stubble, and white face glowing—arms raised like some iconic Christ. The figure shuffles through the snow, palms and face raised toward the night sky.

Roth sets his drink down on a table, ready to go out and fetch the old man—or at least see if the vision is real—when Viktor Afanasiev, Sergei Krikalev, and Vasilisa come out to the porch.

“Ah, it is Old Dmitry Dmitriovitch, Viktor’s neighbor,” says Sergei, whose English is excellent. The cosmonaut has trained in Houston, flown on the shuttle, and spent months on the ISS. “He lives in the caretaker’s house at the neighboring dacha and wanders over here regularly. It is not a problem in the summer, but Viktor worries that the old man will freeze to death on such nights as this.”

“What is he saying to the sky?” asks Vasilisa. “Is he senile?”

“Perhaps,” says Viktor, pulling on a goosedown jacket and fur hat that he keeps on a peg near the back door. “He cries to the sky because his son is a cosmonaut who has not returned from space.”

Roth looks surprised. “Someone who is up there now? Or someone who

died?”

Viktor grins. “Old Dmitry’s son is a businessman in Omsk. The old man dreams and walks in his dreams. Please excuse me.” He goes outside and through the haloed glass, Roth, Sergei, and Vasilisa watch as Viktor leads the old man back across the lawn and out of sight through the bare trees.

A cassette recorder is playing loud martial music and thirty or forty Russians in the overheated main room are singing the words to the song. Vasilisa crosses the room to stand next to Roth. “It is the unofficial cosmonaut anthem,” she whispers and then interprets softly as the Russians sing.

The Earth can be seen through the window

Like the son misses his mother

We miss the Earth, there is only one

However, the stars

Get closer, but they are still cold

And like in dark times

The mother waits for her son, the Earth waits for its sons.

We do not dream about the roar of the cosmodrome

Nor about this icy blue

We dream about grass, grass near the house

Green, green grass.

The Russians applaud themselves when the song is done.

ANhour before midnight, Roth meets an American millionaire—Tom Esterhazy—who is scheduled to be the next paying “tourist” that the Russians will send to the international station. Esterhazy, who is drinking only bottled water, explains that he was a research mathematician at Los Alamos and at the Santa Fe Complexity Institute before he made his millions by applying new theorems in chaos mathematics to the stock market.

“The market is just another complex system constantly teetering on the edge of chaos,” says Esterhazy, speaking softly but close to Roth’s ear to be heard over the rising noise of the crowd. “Like the moon Hyperion. Like the ripple dynamics of a flag in the wind or the rising curl of cigarette smoke.” The younger man gestures toward the cloud of smoke that hangs in the room like a smog bank.

“Only you can’t make hundreds of millions of dollars analyzing flag ripples or cigarette smoke,” says Roth, who has heard of the man.

Esterhazy shrugs. “If you’re smart enough you could.”

Roth decides to play reporter. “So how much are you paying Energia and the Russian Space Agency to get this ride?”

The young millionaire shrugs again. “About what Denis Tito paid, I guess. It doesn’t matter.”

It must be nice,thinks Roth,to be able to think that twenty million dollars doesn’t matter. He says instead, “What are you going to do during your four days up there?”

“Look at clouds.”

Roth starts to laugh—hisNew York Times editor had made some joke about this guy looking at cloud tops—but stops when he realizes that the millionaire is serious. “You’re paying all that money just to look at clouds?”

Esterhazy nods, still serious, and leans closer to talk. “My expertise is in fractal analyses of the edges of destabilizing complex systems. Clouds are the ultimate example of that. When I was a researcher in New Mexico, I used to set up trips to conferences just so I could look down on clouds from the planes. I never went to the conferences themselves, I just wanted the plane ride. When the Los Alamos lab found out, they turned down my conference requests. Later, when I made the money on Wall Street, I bought a Learjet just so we could fly above the clouds.”

Roth nods, thinking,This man is certifiable. No wonder the Russians are contemptuous of us. He says, “Will it be that much better to look down at clouds from the space station rather than from a jet?”

Esterhazy looks at him as if it is Roth who is crazy. “Ofcourse. I’ll be able to look at cloud patterns covering tens of thousands of square miles. I’ll be able to see cirrus and stratocirrus across huge swaths of the South Pacific, watch cumulus build twenty kilometers high across the Urals. Ofcourse it will be better. It’ll be unique.”

Roth nods dubiously.

Esterhazy takes his arm in a tight grip. “I’m serious. Imagine being a mathematician trying to understand the universe through the study of waves—regular waves, ocean waves—but your only chance of seeing the waves was from five hundred feetunder water. Nuts, right? But that’s what fractal complexity studies of cloud patterns is like from inside the atmosphere, from the surface. We live at the bottom of a well.”

“But you have weather satellites . . .” begins Roth.

Esterhazy shakes his head. “No, no, no. All mathematics, much less complexity/chaos math, is about seventy percent intuitive. It wasn’t some sort of plodding, successive approximation that allowed me to understand the wavefront dynamic of the stock market. I was there on the floor with a broker friend one day, just gawking, looking at the computer displays and the big board and the numbers crawling and the scribbles of the guys in the pit, when I got the fractal repetition function I needed. Now to understand the fractal dynamics of clouds that way, to be able to predict the chaos at their fringes, I have tosee the clouds. All of them. Get a gestalt view.Feel

the dynamic of it all. Justlook. Four days won’t be enough, but it’ll be a start.”

“You have to become God for a while,” says Roth.

“Yeah,” says Esterhazy. “That won’t be enough, but it’ll be a start.”

ITis a few minutes before midnight when Roth goes alone to the cold sunroom porch to fetch his glass of vodka and sees the old man wandering on the snowy lawn again.

Roth goes to the door to call Vasilisa or his host, but hesitates; the guests are gathered around Viktor in the crowded main room, singing together in the last minutes before the New Year, and Vasilisa is nowhere in sight.

Roth goes to the double door—it works like a glass airlock against the lunar cold outside—pulls on the fur hat Viktor has left hanging there, and walks out into the frigid night air.

Moonlight sparkles blue on the broad hillside that leads down to a frozen lake. The clouds and snow flurries are gone, leaving a sky so moonfilled and star-broken that Roth looks up for a long minute before searching for Old Dmitry again.

There he is, twenty meters downhill from the house, a white figure near the edge of the birch forest. The snow fractures and cracks under Roth’s city shoes.

He opens his mouth to shout the old man’s name but the air is so cold that it cuts into his chest like vacuum rushing in. Roth gasps and holds his chest. He concentrates on breathing as he crosses the last blue-glowed space to where the old man stands, back turned toward Roth, staring up through the birch branches at the night sky. Old Dmitry had been wearing baggy pants and a sweater earlier in the evening, but now he wears long white robes that remind Roth of a shroud.

Roth pauses an arm’s length from the old man and looks skyward himself. Something—a satellite perhaps or a high-flying military plane or perhaps the space station itself, Roth does not know if one can see it from Moscow—cuts across the starfield like a thrown diamond.

Roth looks down again just as the old man turns toward him.

It is Roth’s father.

Roth lifts a hand to his own chest. As if in response, his father lifts a hand—at first Roth is sure that his father is going to touch him, touch his face, touch his son’s aching heart—but the arm and hand continue rising until the long finger is pointing at something in the sky behind and above the writer.

Roth starts to turn to look when the great roar and brightness fills the air around him, surrounding him and entering him like fire. He clenches his eyes tightly shut and clasps his hands over his ears, but the flare of light and roar of noise break through and overwhelm him.

Flames. The flames of hypergolic fuels mixing, of solid-fuel boosters lighting off, of the shuttle's main engines firing and theSoyuz 's tripartate boosters exploding in energy.

Sound. The roar of millions upon millions of ergs and jules and footpounds of energy exploding into the night in a second, in a millionth of a second. ASaturn V roar, five engines bellowing flame at once. An Energia roar, Mars-rocket explosion roar, controlledN-1 moon rocket three-stage bellow-roar.

He has fallen but does not fall. Roth floats sideways in the air, a meter and a half above the ground. His father holds him, cradling him.

"Relax," says his father, holding him under the shoulders and legs. "Just float. Let the ocean do the work. I'm going to let go."

His father releases him gently.

The roar and flame and vibration surround him again. Roth clutches his left arm with his right hand, feeling the roar as constriction, the flame as pain, but then he obeys his father's command and relaxes, opening his arms wide, lying back, feeling gravity relent.

Roth lets the engine roar carry him skyward, seeing Baikonur fall far below like a snowy chessboard, watching Florida fall below like a trailing finger and seeing the green of the coastal waters give way to the ultramarine blue depths of the deeper sea.

He rises with the roar and on the roar, flashing through high wisps of clouds, feeling the pressure of air and gravity lessen as the sky darkens to black and the stars burn without twinkling.

"Norman. Norman!"

He hears the voice through the roar and knows it is Vasilisa, distantly feels her knee under his head and her hands ripping open his collar buttons but then the voice is gone, lost in the roar and the glow.

The solid rocket boosters fall away.

The first stage separates, falls away, a black and white metal ring rich in solid sunlight, tumbling back toward the blue and scattered white curve of Earth below.

The limb of his world becomes curved, a scimitar of blue and yellow beneath the black cosmos. Roth hears distant voices like whispered commands or entreaties through poorly tuned earphones and knows that he must keep his eyes closed if he is to see all this, but just as he is about to open his eyes anyway, the second stage fires, the flame returns and he is pressed back by g-forces again as he continues to climb into the blackness.

"Bring my bag from the car. Hurry!"

Roth hears this in Russian but understands it perfectly. How strange it was when languages were like walls, separating understanding. Now that he is this high, he can look over any wall.

The noise and flame and compression end as suddenly as they began.

Roth is floating now, arms out, legs extended. He twists his upper body and rotates freely in space, looking down at where he has been. Where he has always been.

He flies toward sunrise. The white clouds move in procession far below him like a sheep moving across a blue meadow. A peninsula of land extends toward the sunrise like a god’s finger parting the green sea. On the night side of the terminator, stratocumulus twenty kilometers high pulse with their own internal lightning.

“Stand back . . . the needle . . . into the heart.”

Roth fumbles away the invisible earphones, tired of the insect buzz of the distant voices. Let TsUP and Houston give their commands. He does not have to listen. Silence rushes around him like water flooding into a compartment.

The sun fills the curve of the world, fires rays across the thin sheen of atmosphere like a stiletto fissure of gold flame, and breaks free of Earth, rising into black space like the broiling thermonuclear explosion it is. Space, he discovers, is not silent. Stars hiss and crackle; Roth has heard this before through recordings from radio telescopes, but they also sing—a chorus of perfect voices singing in a language not unlike Latin. Roth strains to hear what they are saying, this lovely chorus of unearthly voices, but the meaning slides away just beyond the cusp of his understanding. But now Roth rises into the rush and roar of the surf of the blazing sun itself, feels individual photons as they strike his bare skin and sees the curl and wave-crash of the solar wind as it dashes against the pulsing, breathing folds of the Earth’s magnetosphere. Space, he realizes, is not empty at all; it is filled with tidal waves of gravity, great shock waves of light, the braided, living and constantly moving lines of magnetic force, all set against the visible and audible chorus of the stars.

Somewhere, very, very distantly, there is a countdown again—five, four, three, two, one . . . in Russian and English . . . now people are singing and crying and laughing. Roth hears music. It is the New Year.

He opens his arms and is almost ready to let the solar wind carry him farther away, higher, deeper into the singing cosmos, forever beyond the gravity of Earth, but he has something he has to do.

“Breathe, Norman. Norman!”

He shakes the voice out of his ears again, but reaches back, under his pillow. The three folded slips of paper are still there. He chooses one. He raises his clenched fist, opens his fingers.

To read it, he has to open his eyes. He weeps, eyes clenched shut, at the thought of no longer seeing this glory of the receding Earth, of feeling the fatherly embrace of the rising sun, of touching the cool orb of moon, of hearing and understanding the chorus of the blazing stars singing in their X-ray frequencies.

But he has to know which future he has chosen.

Norman Roth opens his eyes.