

Blue Shift

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In one scenario, the universe is expanding slowly enough that the gravitational attraction between galaxies causes the expansion to slow down and eventually stop. The galaxies then start to move toward each other and the universe contracts.

Alexander Friedmann

1.

Early In the 22nd century . . .

“The Space Corps briefing mentioned a high degree of risk in this mission, Commander, yet you guys volunteered.”

“It’s my job, Ms. Thornton,” Astropilot Commander Theo Jacobs said. “And I’m confident. The HAWKING carries the latest deep space monitoring technology.”

“Professor Linville, you could have been Head of the Astrophysics Department at M.I.T. Yet you chose the mission specialist position for this little jaunt.”

A sheepish grin from Dr. James Linville. “Insatiable curiosity, Ms. Thornton. Not a very good excuse, huh?”

“What about you, Ms. Thornton?” Commander Jacobs asked, a cynical grin playing about his lips. “A death wish, perhaps? You’re one of the highest paid anchors at UNN. Too cushy for you?”

Unheeding of Jacobs's barb, she gave him a dazzling smile. "I drew the high card, Commander. Beat out a couple dozen other video news services. Guaranteed multi-year seven figure irrevocable contract. And a Pulitzer Prize in journalism."

Jacobs's expression betrayed his incredulity. "Guts but no good sense, Ms. Thornton." She fluttered long dark eyelashes over aqua-blue irises. "Why thank you, Commander. That's tradition at Universal News Network."

Thornton retrieved her mobile video chip recorder from its narrow stowage space beneath her deceleration couch and loaded a power microdot battery. "Now how about our interview?"

2.

"I detected an air of confusion back at Space Corps Headquarters, Commander. Something unexpected?" UNN reporter Thornton asked.

Jacobs winced as the hovering airborne recorder's miniature boom mike brushed his nose.

He nudged the offending device aside. "True, Ms. Thornton. A bunch of cloistered ivory-tower astrophysicists predicted expansion of the universe would cease, but not for billions of years yet. Big time screwup. They lost the red shift."

"Red shift. Hmm." Thornton tapped keys on her laptop, cerise-tinted lips pursed in concentration. She looked up with a bright grin. "Okay. Got it. The Doppler thing, and

it's lost. Can we find it?"

Jacobs suppressed a groan. "I'll try to explain, Ms. Thornton," the skipper of deep space probe STEPHEN W. HAWKING muttered, his distrust of media types concealed behind a thin-lipped smile.

"Who had approved a video reporter for a mission this dangerous?" he wondered. Space Corps Brass? Congress? The White House? HAWKING's cramped enough with just the essential crew members.

"Publicity and politics. Court-martial and loss of pension if I refuse," he mumbled under his breath. "Damn."

"Commander?"

"Nothing, Ms. Thornton."

3.

She gave her head an attentive-cocker-spaniel tilt. "Red shift, Commander?"

Theo Jacobs massaged his temples. The oncoming migraine would be a bitch. Is this flaky reporter General Shaw's revenge? What have I done to piss him off?

He took a deep breath. "All right, Ms. Thornton. Red shift."

"Keep it simple, okay. I'm no Einstein."

Jacobs chewed his lower lip. Simple indeed. Think of your hazardous duty pay, Theo.

“You know that stars and galaxies give off visible light, okay?”

“Uh-huh.”

“Light is transmitted in wavelengths. Red is at the wide end of the prismatic spectrum. You know what a prism is?”

“Hmpf,” she sniffed. “I’m not a total ditz, Commander.”

Jacobs clenched his fists tightly, out of sight behind his back. “No offense. If the celestial source, say a star, is moving away from us, the distances between wave crests become wider. The red end of the spectrum. That star will look red when viewed through certain filters. As you noted, a Doppler effect.”

Nervous tug on an earlobe. “Star moving away. Got it . . . I think.”

Jacobs exhaled audibly through pursed lips. “Everything in the universe is moving away from some unspecified central point. This validates the Big Bang origin of the cosmos.”

Thornton’s jaw dropped. “Geez. You mean only God was here before?”

“The expanding universe is accepted theory, Ms. Thornton. Many attach religious significance to the Big Bang. This mission is only to confirm a stabilized universe. We’re trying to figure out why astronomy mavens throughout history were billions of years off in predicting it.”

4.

“A dumb question, sir?”

Jacobs rolled his eyes. Why was there no ejection port on the HAWKING? “Yes, Ms. Thornton?”

“What if it starts shrinking?”

“God give me strength,” Jacobs mumbled.

“The contracting universe is an unlikely twentieth century theory propounded by a Russian physicist, Alexander Friedmann,” the Commander continued. “He said the cosmos is like a rubber band and will eventually snap back to where it began. The so-called Big Crunch.”

Her eyes grew wide. “You gotta be kidding. A Big Bang implosion? What could cause that?”

Jacobs turned to Dr. Linville. “You handle this one, Jimmy.”

“You bet, skipper.” The astrophysicist looked up from the instrument console with a boyish grin and rubbed a hand across his blond crewcut. “Universal gravitational forces, Ms. Thornton. Causing the advancing margin of space to slow and stop, then reverse. It’s an old theory. Obsolete. No supporting data.”

5.

Ms. Thornton peered through the forward viewport, eyes wide with wonder. “What happened to the stars?”

“We’re approaching the expanding rim,” Commander Jacobs said.

“The rim of the universe? So soon?”

“You were briefed on the Lynch intergalactic propulsion system, were you not?”

A defensive grimace. “Of course, Commander. Not that I’d understand that gravity drive gobbledegook.”

She flagged down her circling recorder and popped in a fresh video chip. “Another question, sir. Will we pass the rim?”

Jacobs’s frustration hung in the air like a thundercloud. “Not if I can help it. We’ll keep pace with the boundary, Ms. Thornton. We can’t go further.”

Her lips crinkled in a quizzical grin. “Why the heck not? Aren’t you curious about what’s on the other side? It would sure improve my chances at a Pulitzer if I were the first media person to . . .”

Jacobs’s deep sigh signaled resignation. “Too dangerous, Ms. Thornton. Space Corps tried to send unmanned probes through some years back. They failed to return. The first

manned spacecraft also went missing at the edge. Colonel Andrew Davis's mission."

Thornton covered her mouth with a hand to suppress a gasp of dismay. "Oh my God. Poor guy. I'm sorry. What happened?"

"He must have miscalculated the rate of slowing of the advancing boundary and overshot." Jacobs gave her an odd smile. "Dead-bang into the singularity."

"Singularity. Sounds mysterious."

A brief tic appeared at the corner of Jacobs's left eyelid. "The Big Bang was a singularity. Didn't the Space Corps briefing explain that the expanding edge retains similar properties?"

Shrug of shoulders. "A lot of physics mumbo jumbo. Something about time and space folding up."

The Commander stuffed two sticks of chewing gum into his mouth. Why had he ever quit smoking? "Professor Stephen Hawking coined the term singularity. Am I right, Jimmy?"

"Right on, skip," Dr. Linville said. "Singularity. A point at which the space-time continuum becomes infinite. Like in black holes, when dead stars collapse to zero mass and volume. At such a point, time as we know it ceases to exist. We believe the universe started that way. Does that help, Ms. Thornton?"

She gave her head a confused shake. “Sort of, I guess. And Colonel Davis flew dead-bang into it?”

“True. And some spatial and temporal displacement obviously occurred.”

“Huh?”

“Jimmy’s way of saying time travel, Ms. Thornton,” Commander Jacobs said.

She raised a skeptical eyebrow. “You’re telling me Colonel Davis is sometime else?”

“We don’t know. He should have sent a tachyon-enhanced transmission from wherever he ended up.”

Ms. Thornton nibbled a cerise-painted thumbnail. “So why didn’t he?”

Jacobs drummed his fingers in an agitated tattoo on the computer console. “The downlink was lost. Telemetry quit. All mission data from the edge were erased.”

“Come on, Commander. Aren’t those systems supposed to be foolproof?”

“That’s what Space Corps thought. Davis has failed to respond to all attempts at communication.”

“Why no rescue mission?”

Jacobs gave her a genuine smile. “Good question, Ms. Thornton. No reference points. Celestial navigational parameters don’t work at the rim. We wouldn’t have known where to look. An intergalactic Bermuda Triangle, if you will.”

6.

An earsplitting whine filled the cockpit. Ms. Thornton clasped both hands over her ears and stumbled to the deck. Her countenance betrayed a hint of panic. “What was that? Is something wrong?”

“Our inertial dampers. The boundary must have become unstable. Our Lynch drive is programmed to alter our course if that happens. With such a vector change at speeds like ours, the dampers kick in. Otherwise, we’d be squashed like bugs on an aircar windshield.”

Jacobs extended a hand to help her to her feet. “It’s okay. This is one of a number of scenarios we were prepared for.”

There was a shrill beep from the computer console. Columns of figures scrolled down the CRT screen. “Excuse me a moment,” Jacobs said.

“Oh, hell . . .” His elbow nudged a coffee cup from the console stand. It shattered on the deck, stoneware fragments and coffee spreading in a geographic blob.

Jacobs stepped around the mess and peered over his mission specialist’s shoulder. “What are we looking at, Jimmy?”

Linville’s fingers tapped computer keys. “Response time slowing, skipper. No explanation. Diagnostics are green board. Wait just a sec . . .” He touched the screen with

a fingertip. “There! I’ve got something.” He cued up overrides. “This just doesn’t make any sense. Verifying now.”

Commander Jacobs gaped in disbelief. “You’re sure of this?”

“Checked and double checked. No stabilization. We’re gonna go blue shift.”

Sheila Thornton stood on tiptoes, peeking over their shoulders, her video chip recorder viewing from overhead. “What’s blue shift, guys?”

“Wave crests compressing, Ms. Thornton. Blue end of the spectrum. The alleged brains screwed up again. Our universe is about to start shrinking.”

7.

“So Professor Friedmann was right?”

The Commander’s lips twitched in a perplexed grin. “Looks like it. His closed universe model.”

“What’s gonna happen now?”

Jacobs gave her a disingenuous grin. “We’ll be faced with a series of major paradoxes.”

Thornton brushed a wayward auburn lock from her face and tucked it behind an ear.

“Paradoxes? Like what?”

Commander Jacobs interlaced his fingers behind his neck and stretched. “We’ll get younger, perhaps crawl back into the womb. We’ll remember the future because we’ll already have been there. Just think. The Galactic Lottery, ours for the taking. World Series and Kentucky Derby winners. Results of presidential elections. The possibilities will be endless.”

Sheila Thornton’s grin was radiant. “Tell you what. I’ll split the lottery payoff with you guys, okay?”

Jacobs clutched his temples, as if in pain. “I made a bad joke, Ms. Thornton. Such a scenario is impossible. We can’t overturn the Second Law of Thermodynamics.”

“More physics, Commander? You lost me again.”

8.

“I’ll pass to Dr. Linville again. He’s the expert.”

“We can’t know the future, Ms. Thornton. Everything in nature tends to move from a state of order to disorder.”

She shook her head as though trying to dodge a troublesome insect. “C’mon, Professor. A lay person’s explanation, please?”

Linville gave her an agreeable smile. “I’ll try. Say an ordinary chicken egg represents order. Then you crack its shell, dump it in a frying pan and scramble it. That’s disorder. Are we okay so far?”

A dubious nod. “Disorder. Scrambled eggs. Good breakfast.”

“Now I want you to unscramble the egg.”

Thornton laughed out loud. “Impossible. You would have to turn the clock back.”

Dr. Linville raised a triumphant fist. “Exactly. You’ve got it now, Ms. Thornton. That’s the Second Law of Thermodynamics. It gives a direction to time.”

9.

Suddenly Commander Jacobs looked up with a puzzled expression. “Wait one, Jimmy. Something odd here . . .”

The spacecraft’s cockpit was beginning to fill with cold gray mist. Voices assumed a faraway bass-register echo chamber quality, decelerating like playback from a recorder with a dying power microdot. Ms. Thornton watched in growing fascination as seconds on the date-time chronometer slowed to a crawl, then with infinite slowness began to reverse.

The fragments of Jacobs’s coffee cup rose from the deck in ultra slow motion and fit themselves together like a cosmic jigsaw puzzle. Drops of spilt coffee coalesced in ever-enlarging globules, dribbled back into the now intact cup.

Jacobs’s hand poised motionless over the instrument displays, a look of confused apprehension on his face. “They were all wrong. Even you, Jimmy. The Big Crunch. There went your Pulitzer, Ms. Thornton notnrohT .sM ,teztiluP ruoy tnew erehT .hcnurC giB ehT”

10.

“Who are you?” Sheila Thornton asked the spacesuited figure floating beside her in the stygian blackness of space.

“Colonel Andy Davis, Miss. Pilot of the space probe EDWIN HUBBLE.” He cast a mystified glance at the myriads of stars and galaxies flashing past. “Are you the rescue party? Took you long enough to get here. Wherever here is.”

“Took us a while to untangle the Second Law of Thermodynamics, Colonel. I can tell you a couple of things for sure, though. When we catch up, I’m a cinch for a Pulitzer Prize in journalism. Then you and I will split the Galactic Lottery payoff with a couple of friends of yours. Gotta find Professor Friedmann sometime, too. He’s got a share coming.”

The End