

QUESTION: In all your time away from life on Earth, what did you miss most?

RACHEL: (long pause) Pizza.

INTERVIEW AT YELAHANKA,

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RACHEL

“It’s so big!”

Rachel Stewart’s first view of Earth, as she returned from two decades of exile, was a shock:

Earth looked exactly as she’d pictured it.

When she and her crew launched from Keanu, their Near-Earth Object habitat for twenty years (and currently making its own approach and preparing to go into an orbit beyond the Moon), their former home world looked like a fat whitish-bluish hemisphere. Rachel had learned long ago that the Moon was the size of a dime held at arm’s length. In her case, on launch day, Earth from five hundred thousand kilometers was about the size of a quarter.

Keanu and their transfer vehicle, *Adventure*, were approaching the planet from its southern pole, so what they saw, in the relatively few times cameras or windows were pointed earthward, was the Antarctic surrounded by ocean.

To Rachel’s surprise, having grown up with the threat of melting ice caps, Antarctica was still white and snow-covered. How deeply, she had no way of knowing.

But it was reassuring. Especially as *Adventure*’s speed increased as

the vehicle flew closer—so much closer that Rachel revised “flew” to “fell,” since that’s what they seemed to be doing.

The only response to Rachel’s comment came from Zeds, the Sentry pilot, in his Hindi-tinged English. “I thought human childhood habitats looked small when revisited.” *That’s what happens when you raise aliens as if they were human*, Rachel thought. *They grow up just as argumentative as their two-armed cousins*. The sarcasm was apparent even through Zeds’s environment suit. (It was odd for Rachel to know that *Adventure* had originally been built by and for Sentries—but the Sentry pilot was the one forced to wear a suit.)

“Shut up and land this thing,” Pav said. That was her husband, Pav Radhakrishnan. Now thirty-six by Earth’s calendar, he had grown stolid and confident while still, in stressful moments, capable of acting like a hotheaded teen male.

“Daddy!” That was their daughter, Yahvi, fourteen, speaking from her couch slightly behind Rachel’s left shoulder—sparing Rachel the wifely duty of correcting her husband, a job she never liked and wasn’t good at.

There were actually six in *Adventure*’s cockpit: Rachel and Pav and Yahvi, Zeds the pilot, plus Xavier Toutant and Sanjay Bhat. The latter two, like Rachel and Pav, were members of the original HBs—the “Houston-Bangalores” who had been scooped off planet Earth twenty years back and transported to Keanu. Xavier came from Houston; he had been the HBs’ scrounger and jack-of-every-trade for two decades.

Never shy, he grunted and said, “Let’s just do it the way we practiced.”

Sanjay, on the other hand, was one of the quieter members of the Bangalore crew. . . . Rachel hadn’t even known his name until at least a year after their arrival on Keanu. Granted, there were more than 180 people to meet and get to know in those days, after humans expelled the Reivers from Keanu . . . but in the confines of the human habitat, it wasn’t as though Sanjay could easily escape attention.

But he had.

Nevertheless, he had proven himself to be one of the masters of the proteus, Keanu’s 3-D printing and fabrication system . . . the nearly magic Architect technology that allowed humans to (a) get rid of the Reivers, (b) make supplies and equipment, and, ultimately, (c) turn

themselves into the galaxy's smallest spacefaring civilization. If anyone could take credit for the design, construction, and operation of *Adventure*, it was Sanjay.

"Entry interface," Sanjay said.

Adventure began bumping at just that moment, much like an airplane hitting turbulence. As her mother, Megan, had reached for her hand during flights across the Rockies and into Houston on horrible stormy afternoons, Rachel reached for her daughter's.

She had faith in *Adventure* . . . as much faith as anyone could place in a machine that was several thousand years old and built by a race of sentient aquatics on a world far, far away.

It was, when she looked back, a crazy challenge—outfitting an ancient spaceship preserved in vacuum for centuries. How do you do that?

Well, first you turn the work over to two dozen former Indian Space Research Organization (ISRO) spaceflight engineers. Given the proteus tools available to use in the Keanu system, the largest challenge was . . . theological. That is, technical challenges turned out to have possible solutions, all of them workable, in theory.

What kind of propulsion system should the Sentry vessel have? Thermal protection? Environmental?

Should it spin or tumble to provide artificial gravity?

The development took six years, once Rachel and the others realized they were truly headed back toward Earth and would inevitably have to land there. Some of them, anyway. (And as the anointed ruler of the HBs, a job she kept trying to shed, Rachel knew it would have to be her.)

First, the HBs had tried to create an indigenous lander. After all, they were already using proteus printing to fabricate engines, control systems, environmental systems, seats, and everything else . . . why not the actual shell or, as Sanjay and former astronaut Harley Drake kept telling her, "The bus, Rachel. It's called a *bus*."

Their first "bus" was a stubby, short-winged thing like one NASA had tried to build around the year 1995. It was called the X-38, Rachel thought—she remembered her father, Zachary, talking about it. It never flew as more than a prototype, but it was the model they used.

And during its first launch from the surface of Keanu—*launch* being an extreme word for a process that essentially involved squirting some

reaction mass downward, causing the X-38 to float off the surface—the vehicle failed. Some defect in their design or manufacture caused the X-38 to break up when its main engine fired to put it in a big looping test orbit.

Two HBs died, including Shane Weldon, one of the original space professionals from NASA who'd run Zack's mission to Keanu.

So, with time running out, and no wish to come up with a new design and risk another failure, Rachel and Sanjay and company turned to the Sentry ship that had been parked on the surface of Keanu.

The Sentry ship was a needle-nosed, stubby-winged thing that looked like a tapered artillery round. Over the centuries it had been stripped and looted like a pharaoh's tomb; when humans first discovered it, it was literally just a shell.

But what a shell! Sanjay and his team were amazed at the structural integrity of the Sentry ship the first time they pumped air into it. "The leak rate is better than *Brahma*!" *Brahma* had been the Coalition craft commanded by Pav's father, the one that landed on Keanu back in 2019 a few hours after Zach Stewart's *Venture* spacecraft.

Once the HB team proved that the Sentry ship would hold air, it was time to equip it with propulsion systems and fuel tanks (all of it, every molecule, arranged and/or manufactured in the human habitat) and items like storage lockers for food and cargo, and seats (human-sized, except for one) and controls and . . . well, a shitload of equipment. Since the cockpit was designed for Sentries, who were generally a half meter taller than humans, five of the seats wound up having to be suspended in the middle of the volume, "like flies in a spiderweb," in Sasha Blaine's unhelpful words.

One other major task was coating the exterior of the Sentry ship with a thermal protection system. Sanjay's rudimentary analysis showed that the "metal" of the Sentry shell was unknown. Obviously, as Harley said, "given that it's lasted ten thousand years, it must be pretty fucking robust." But they had no way of knowing how it would withstand the thousand-degree temperatures of reentry into Earth's atmosphere.

So they elected to coat the entire exterior in the same material used for the X-38 . . . a light silica-based compound that had been evolved from the space shuttle by *Brahma*'s engineers. The extra layering spoiled the

Sentry ship's clean, classic lines . . . but everyone felt safer knowing that they had protection during reentry.

This work took years. In fact, when *Adventure* finally launched four days ago, Rachel was still not sure they had done everything possible, run every test.

They had, however, taken time to do one old-fashioned thing: They had given the Sentry ship a name, *Adventure*, partly to honor the original *Venture* that brought Rachel's father's crew to Keanu . . . but mostly to remind them of their new mission.

But they had simply run out of time. Keanu was approaching Earth, where it would be a fat target for Reiver weapons. Jaidev, Harley, and all the HB leadership had agreed: *Adventure* had to reach Earth at the first opportunity.

Now here they were, passing the Antarctic, dropping lower and lower, over the empty expanse of the Indian Ocean. To their right, roughly northeast, they could see a huge cloud formation. "Cyclone," Pav said. "Bad news for Indonesia."

"Is it still called Indonesia?" Xavier said.

A new voice sounded inside the cockpit. "*Adventure*, this is Bangalore Control—" Rachel sat up at those words, since she remembered hearing them from *Brahma* mission director Vikram Nayar back during that horrible week of the *Venture/Brahma* landings, the deaths, the mess that led to her arrival on Keanu.

Rachel and the HBs had been in touch with Earth for thirty months, of course. Carefully. The HBs suspected that the Reivers had reached their home world as many as nineteen years in the past, once they'd been expelled from Keanu. But they had no information about the success of their invasion, the extent of the infection. Well, there had been stray, strange transmissions warning Keanu and the HBs to . . . stay away.

As if they would. As if they *could*.

There had also been odd, plaintive transmissions from India and the United States, people asking for information on loved ones lost twenty years ago. Sasha Blaine began to build a database, but it was already heartbreaking: They knew that a handful of names were not among the HBs, meaning they had gone missing—or died—on Earth in 2019.

"Bangalore, *Adventure*. At forty-five thousand meters, descending.

Are you tracking?” Pav was handling the communications, for obvious reasons. He was human; he was from India; and he had been Keanu’s only voice link with Earth so far.

“We are tracking you,” Bangalore said.

Pav glanced over his shoulder at Rachel. “So they can still do that much.”

Their imaging systems and signal intercepts had led the HBs to believe that humans had given up spaceflight. They had detected no air-to-ground transmissions (an obsolete phrase, but still the best they could do) from lunar bases or Mars orbiters. They weren’t even sure there were still space stations.

What popular or historical material they had managed to screen confirmed this: The last two space missions in the history of human spaceflight had been to Keanu in 2019.

Popular history and entertainment mentioned “visitors” and “benefactors” known as the Aggregates, but with few useful details. Earth had changed in twenty years, obviously. The global environment had continued to evolve; Arctic ice was largely gone and sea levels had risen.

There had been the usual wars, all of them regional. Some nation-states and associations seemed to have disappeared; there was no mention of a United Nations, for example. They saw references, however, to the Free Nations and the Western Alliance. (Overall, they didn’t see nearly as much broadcast material as expected, though surely their position—far out of the solar system plane—their sheer distance, and their lack of a receiving network had a lot to do with it. There was also the reality that most of Earth’s communications were now short-range or through fiber-optic nets, not spewed into the galaxy at large.)

What was most intriguing was the rise of a religious-scientific movement called Transformational Human Evolution. The HBs had not been able to find out just what it was, only that a lot of people—in the tens of millions, possibly hundreds of millions—were members.

If you look at it one way, Rachel thought, *we’re arriving as emissaries . . . another way, as scouts.*

Another way—as irresponsible parents. She and Pav had spent hours debating the wisdom of bringing their daughter on such a dangerous voyage. It wasn’t just to give her the kind of educational sightseeing trip

Rachel's parents had given her, though it seemed appropriate that Yahvi should visit her ancestral world.

The reason was this: While *Adventure* was capable of being refueled and could conceivably have launched in a high, looping Earth orbit that might have eventually taken the crew back to Keanu . . . Rachel and Pav fully expected this to be a one-way trip.

When they left Keanu, the six of them were saying good-bye to friends and their home.

And, given those circumstances, Pav and Rachel were simply unwilling to leave Yahvi behind.

As they dropped lower, the initial buffeting lessened and they found themselves in the rosy glow of plasma. "We're leaving a bright streak across the Indian Ocean dawn," Sanjay said.

"How is the temp?" Pav asked. Why, Rachel didn't know. If it was too high, they were in deadly trouble. It wasn't as though they could do anything about it.

"Shields are holding," Zeds said, which almost made Rachel laugh, since it sounded like a line from a movie she remembered watching with her parents.

"How unlikely is this?" Xavier said. "A ship designed to return from Keanu to the Sentry world ten thousand years ago and God knows how many light-years from here . . . and now it's landing on Earth!"

Rachel could see Pav shrug. Zeds just grunted, a peculiarly human reaction.

Things began to happen very quickly now. A guidance system was doing the actual piloting: Zeds and Pav were simply monitoring—or, in Pav's case, worrying aloud.

They were low enough now, over the Laccadive Sea, that Bangalore had had to alert air traffic to their passage—but still high enough that they could see, off to the right, the northwestern coast of Sri Lanka.

But just like that they were over India proper, heading directly north up the tip of the subcontinent. "Was that Madurai?" Yahvi said. Rachel had asked her to keep quiet at this time, but at fourteen it was hard to remember parental orders—Rachel knew from experience. And besides,

she was proud of the fact that her daughter had tried to learn terrestrial geography.

“Not yet,” Pav said. He had actually flown over Madurai as a boy.

“Coming up on the big swoop,” Zeds said. “Ready to rock it.”

The “big swoop” was a vital maneuver. . . . *Adventure* was currently flying nose forward like a reentering space shuttle. Unlike that vehicle, however, it could not lower landing gear from its belly and glide to a stop on a runway.

Adventure would have to fire its main engines, which had so far been used rather sparingly, first to lift the vehicle off the surface of Keanu four days back, then to change its trajectory, essentially slowing it down, putting it on a shallow “flight” toward Earth.

The stress on the vehicle would be immense. But, having shed much of its original thirty-eight-thousand-kilometers-an-hour speed diving into the atmosphere—turning velocity into heat—*Adventure* now began to ascend, gaining a bit of altitude (and reaching thinner air), going nose up, up, up, and up until the vehicle was standing on its tail . . . and the crew left feeling as if they were weightless and motionless.

They weren’t, of course. They were still flying toward Bangalore at a good clip.

Stress on the vehicle aside, there was also stress on the six of them—the only real g-forces they experienced during the flight. They now felt as though they were being pushed deeper into their couches, possibly with the addition of a fifty-kilogram weight on their chests.

But that lasted only for a minute or two. Zeds was especially silent and obviously struggling. Rachel had learned that the gravity of the original Sentry world was half that of Earth, and the Sentry habitat was stabilized close to that. (Sentries always seemed unhappy when they entered the human habitat; it was due to being twice as heavy as they liked.) Zeds wore a protective suit that offered support, but he still had to be feeling flung about.

Rachel and the other humans were in street clothes. They weren’t expecting multiple g-forces, or not for more than a few seconds, so suits weren’t needed.

Xavier did utter “Shit” a couple of times. And there was at least one audible whimper in the cockpit. *That was me*, Rachel realized.

“Good job,” Pav said, surely intending that for *Adventure* herself.

As things smoothed out, Rachel began to feel relief—she had not realized just how worried she had been about the big swoop.

Now she and the others felt as though they were falling backward, as *Adventure* rode its rocket down and to the north. A rearward-facing camera showed a large city passing beneath them . . . Bangalore. But they were going too fast and their field of view was too narrow to identify any landmarks, just the mass of the big city itself.

When the HB Council decided that landing in India was preferable to Houston or Florida in the United States (there were more of the mysterious THE folks in America than anywhere else), Bangalore became the choice.

The actual target was an Indian air base north of the city called Yelahanka, which had been chosen primarily because it was the closest controlled airport to the former Bangalore Control Center. The mission control building and surrounding territory had been destroyed by a Keanu vesicle in August 2019, but a larger space research campus survived.

“Two thousand meters,” Pav said. “Descent speed is good.”

“Feels a little sluggish to me,” Zeds said.

The moment he uttered those words, *Adventure* shuddered and a red light flashed on the control panel. (The designers had kept the earthly conventions wherever possible.)

Before Rachel could react—or even feel fear—Yahvi’s hand landed on her shoulder.

“Relax,” Zeds said. “We’re still good.”

“But losing some altitude,” Pav said. For a moment, they exchanged terse, operational chat, like all pilots Rachel had ever heard on every airplane flight she’d ever taken.

“I saw a flash from one of the screens,” Pav said.

Then Zeds added, “I think we lost part of the tail.”

Hearing that, Rachel almost choked. The tail was actually a set of four fins, each providing aerodynamic control and landing support. Losing one or part of one might not be fatal, but it was certainly not *good* news.

“We’re holding steady,” Zeds said after a long ten seconds. “Still under control.”

“A heads-up would have been nice,” Pav said.

Rachel wished again they could have kept constant contact with Keanu, a hopeless task given the NEO’s distance from Earth and the lack of relay satellites.

The ultimate mission? Historically humans thought about visiting other worlds in order to explore. But no matter how much it had changed in two decades, Earth was their home . . . so exploration wasn’t the goal.

Another classical reason was to find some vital element or mineral, and God knows the Keanu HBs could have used food, clothing, and any of a hundred thousand items from Earth, from books to shovels to electronics. They had been able to fabricate many items, but they were only as good as their memories—or ability to reinvent certain items. (It would have been great, Rachel believed, to have been able to buy an RL-10 rocket off the shelf, rather than try to fabricate something like it.)

Another motive for great human voyages, of course, was war.

So, really, the flight of *Adventure* was a bit of all three. Which made it sound as though there were a real plan. But for the first ten years of her life on Keanu, Rachel and her colleagues had concentrated on surviving in their original habitat, all the while trying to learn how to control the NEO.

That job had previously belonged to a race called the Architects, the original builders of the NEO who had launched it on its ten-thousand-year mission.

But the only Architects the humans had met had been Revenants . . . formerly alive beings revived to communicate with humans, to tell them, in Rachel’s view, just enough to make their lives difficult.

Eventually, using clues from the last Architect, the HBs had learned how to “fly” Keanu, turning it back toward the solar system for this curious mission.

Missing tail fin or not, *Adventure* was still flying, still descending at a survivable rate. Pav reached to his left and patted Zeds on the shoulder, or one of the pair on the Sentry’s right side. “Looking good!”

Rachel allowed herself to feel hope—right up to the time *Adventure* crashed.

It wasn't a serious crash, an auger-in at great velocity. No one would have survived that.

But it was a hard thump down, the silvery shell smashing tail-first into a grassy apron north of the main Yelahanka runway.

Pav's last words were, "Too fast!" Rachel had sat through a number of simulations, though nowhere near the number Pav and Zeds had performed. She could read the changing numbers—altitude and speed—and saw that the altitude number was getting low while the speed remained too high. (When, in rehearsals, she pointed this out from her backseat spot in the cockpit, Pav would often remind her that it was her *father* who was the astronaut, not Rachel. Of course, she could and did say the same to Pav.)

She wondered what "too fast" meant. As in too fast for comfort? Or too fast for survival—

In those twenty seconds, Rachel watched the view screen with horrid fascination, the tarmac rushing toward them not much faster than it had in their sims, Yahvi saying, "Mommy . . . !" Even Xavier couldn't go silently into that not-so-good night, moaning, "No, no, no!"

She was thinking, *I'm going to die here, stupidly and so will my daughter. Why did I put her at risk?*

"Are we on the runway?" Pav asked.

Rachel wanted to scream, *Who cares?* But Zeds answered, calmly, "No, but I think it's going to be okay—"

They crunched with a sound like a Dumpster falling two stories onto concrete. The impact was greater than the worst airline landing Rachel had ever experienced. The couches cushioned the impact, but a large piece of the control panel broke off and fell, barely missing her and Yahvi.

Adventure rocked, shuddered, seemed to sink into the grass . . . then finally settled, at a bit of a list. They were on their backs, pinned like insects, looking up, feeling full Earth gravity after several seconds of multiple Earth gravity. Rachel felt sick to her stomach.

"Bangalore, *Adventure*," Pav radioed. "No matter what it looked like out there, we're down and safe." Then he glanced over his shoulder to give Rachel and Yahvi a smile.

At that moment, Xavier said, "Oh, Jesus Christ!"

Seeing what Yahvi, Zeds, and Rachel could not, Pav's expression

changed. He touched his headset. “Correction, Bangalore, we’re going to need emergency medical assistance!”

Now they all looked toward the rear or bottom of the cockpit, where they saw Xavier, his restraints unhooked, trying to get to Sanjay’s couch a meter away. It likely didn’t matter; Xavier wouldn’t be able to do much.

The broken panel section had hit their genius designer and engineer right in the head.

Rachel was thinking, *First Venture, then Brahma, now this.*

The Stewart and Radhakrishnan families should never be allowed to land another spacecraft.