

The *Resolution* retreated to Tière's Hills cloud while MechRat digested the data that he'd been granted access to by their reluctant commander. They entered orbit around a kilometer-long asteroid that had long ago been deemed too far from the star to bother mining, though it held a fair amount of rare elements that MechRat claimed would be useful for them to build his new weapon. Horizon and Lift went down to the asteroid on the *Dustbin*, putting the old ship's mining equipment to its original use, supplemented with some of the latest FedTech from the *Resolution*'s printers.

A week of drilling into asteroid and refining trace metals later, the raccoon and ox flew back up to the mother ship. After soaring through space in a starship that responded to her very thoughts, piloting a rocket-based craft with hand controls felt clunky and inelegant to Horizon, she wondered if MechRat might upgrade the old ship with neural controls once he had the time. On docking with the *Resolution* she took a pallet of lanthanides once Lift had loaded it and went off towards MechRat's workshop.

The opossum was deep in a simulation trance when Horizon entered, she shot him a message on the ship's network.

Horizon: I'm here with the first load of your rare metals.

MechRat: Oh, gimme a minute to log out.

Horizon: I got another couple loads to bring up, take your time.

MechRat: No, this'll only be a moment. I want to show you something.

MechRat's body twitched as his eyes rolled around in their sockets, he let out a yawn and stumbled about before fully coming to his senses. Horizon wondered if she looked that awkward when de-integrating from the ship. "Good to see you in the augmented flesh again. It wasn't too dusty on that rock now was it?"

The raccoon snorted. "The dust was fine, it was the methane ices that were the real problem." Her toes twitched involuntarily at the memory of the cold. "What did you want to show me?"

"Right here," the engineer drew Horizon's attention towards a pair of vises on a workbench, holding up a thin disk the size of her palm. "That is the secret of artificial gravity right there."

Horizon reached a finger towards the disk, and gasped in confusion. It felt like her finger was pointing downwards, while the rest of her body was also oriented downwards but at a 90 degree angle. "It's generating gravity?" She speculated out loud.

"No, well sort of." MechRat replied, excitement showing in his voice. "The source of the gravity is artificial, but the gravity itself is very real. That little disk contains a synthetic microsingularity."

Horizon snapped her hand back abruptly. "You mean there's a black hole in there?!"

"Only a very little one." MechRat tried to reassure her, rather in vain. "It masses less than a gram, without that containment structure it would have evaporated before the ship left Ronkall's Oort cloud."

"Don't they generate some sort of radiation?" The raccoon asked, looking up her body's current rad tolerance just in case.

MechRat paused to consider it. "Physics wasn't exactly my main field of study, but I haven't detected any sort of electromagnetic or particular radiation escaping that core. Either some sort of super science

material keeps it contained or the microsingularity doesn't generate any radiation by virtue of its artificial nature."

Horizon glanced at the innocuous-looking disk sideways, the gravity it gave off made her feel uneasy, setting off her inner ear in an odd way. "So, you're using these rare elements we've been mining to what, make more singularities?"

"Maybe later." MechRat suggested. "But, no, I'm using these elements to replicate the containers and the other module components that appear to direct the gravity they produce." He seemed a bit reluctant to admit it but continued. "I stripped this one out of the bridge deck, there's now a corner up there where you won't stick to the floor."

Horizon shrugged. "You can take out all the deck singularities for all I care, I actually prefer microgravity to walking at this point. Just leave enough for us to maneuver."

MechRat smirked. "Hard to believe you were ever a flatlander, Horizon." He emphasized the alias she'd chosen, and she momentarily considered the multiple meanings the word could have. "But, I'll have to clear it by our boss from the inner system. Maybe I can convince him that there could be some advantages to having parts of our med bay or engineering that lacks gravity. Or the gym, did you realize that place has so many microsingularities under the floor that it feels like standing on the surface of Skadi?" He revised his last statement. "Well, if Skadi had a solid surface."

"I haven't used the gym yet." Horizon admitted, and certainly not planning to go in there now. "Actually, I wanted to ask if you might be able to upgrade the *Dustbin*, once you have the time."

"Sure thing." MechRat nodded. "Got used to flying with your brain?"

"Yeah..." Replied Horizon, thinking about how awkward it felt flying by hand.

"No problem, it's mostly software, I can print off the hardware interface right now." MechRat waved at one of the nanofabricators in the room and it whirred to life immediately. "Once I finish the design work on the warheads and start printing those I can install it. Though I'm afraid I won't be able to retrofit it with gravity drives. Even if I had the microsingularities to spare it's just too radical a redesign, the conversion drive at least is still a rocket."

Horizon nodded. "Thanks anyways. Well, I shouldn't let Lift do all the work himself. See you later." She headed back towards the docking bay.

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After another week of design work and printing, MechRat finally presented his work to the rest of the crew. They met in the cargo bay nearest his workshop, in the center of which two boxy cylinders rested on a table. "Here we are, the first black hole bombs in the history of the Tiera system. I can't say whether the Federation ever thought of this before given my lack of clearance for those files, but I have my suspicions."

Princeps spoke first. "Will they do what we need of them?" He asked.

MechRat nodded. "Yes, they should." He activated a hologram that showed one of the cylinders nested within one of the *Resolution's* missile-like Autonomous Kill Vehicles. After a moment the "bomb" was launched from the AKV's nose-gun and impacted a mock-up of a base ship. The ship's hull became

transparent, showing a half-dozen disks like the ones that Horizon had seen in MechRat's shop the week before. The disks were spinning in a ring formation, after a few moments they broke apart revealing tiny jet black spots that rapidly merged with one another. Then the cylinder imploded around the little black hole, falling into it, and then the hologram zoomed out to show the ship's hull buckling around the warhead, forming a crumpled zone in the middle of the cylinder. And then the black hole exploded, producing a wave of radiation that blasted the base ship in half.

"What did we just watch?" Eye asked, speaking for the whole group.

"Isn't it obvious?" MechRat stated. Upon taking in everyone's blank stares he explained. "Six of the stable microsingularities we use for gravity control merged into one unstable singularity that sucked in everything around it before evaporating in a burst of Hawking radiation."

"So long as it works, I don't particularly need to know the details." Princeps retorted. He glanced over the warheads again. "Only two of them?"

"Unless you want to float around half the ship or try to construct the system's second largest fusion reactor so we can make more microsingularities that's all we can afford to build." MechRat explained. "I built one for testing, and a second in order to actually use on the Nebula Company."

"Testing?" Princeps asked. "You're not confident in the accuracy of your simulations?"

"My simulations are the best in the Tiere system." MechRat replied. "But no simulation will ever be able to completely replicate real life."

"Give me an estimate of how likely it is to work." Princeps did not ask, he commanded.

Immediately MechRat stood up straight and answered. "I estimate a 79% chance of success, sir!" Once he had finished speaking he blinked, as if surprised by what he had just said.

"Acceptable risk." Princeps said. "If it fails we can just run and try again. If it works, then survivors will be tempted to try for revenge and we'll need a deterrent."

Horizon was about to voice her objection, but reconsidered Princeps' gamble. There were three possibilities she could imagine. If they tested one warhead, and it worked, then they used the other warhead on Nebula some survivors of the company would inevitably try to attack them. Depending on how much of the fleet survived they might not stand a chance. However, if they saved one warhead they would have a spare to use against any revenge fleet and whoever remained would know they had more than one black hole bomb. On the other hand if they used one warhead against the base ship and it didn't work, but MechRat gathered enough data to make the remaining warhead work the survivors would know that they had manufactured the black hole bombs locally instead of bringing them from Federation space, and they'd have no idea how scarce the resources they needed were. "If it doesn't work, our sensors should have enough resolution to determine what went wrong even in the middle of battle. Especially if we launch a squadron of AKVs with sensor pods streaming data along with the bomb."

"Yeah," MechRat considered. "Yeah, that could work. Shouldn't take more than a day or two to mod some AKVs into armed survey drones."

“Do it.” Princeps ordered. At his command MechRat’s eyes began to glaze into sim-trance but the wolf held up a finger. “But first, a question. You said that we’d need to build the second-largest fusion reactor in the Tiere system to create more microsingularities. What of the largest one? Would that do?”

“Yes,” MechRat answered. “But I was talking about Tier, our sun. We’d need to dismantle a couple planets and build a partial shell around it in order to gather enough power.”

“I see.” Princeps said, sounding disappointed. Though Horizon noted that he seemed to be planning something as he left MechRat to run his simulations.