

## Husun

Alder looked out his window in awe at Earth's lively green and blue, contrasting strikingly against space's soulless black. Today was the bicentennial of the bold move from all nations to move Earth entirely to sustainable resources and energy. After the Earth ran out of fossil fuels, humans tried to restore the planet's natural beauty. Major reform happened, and humans protested against importing dirty energy from outside Earth. In response, all factories on Earth were dismantled to restore Earth to its natural beauty.

However, there were still factories. Lots of them, just outside of Earth. Over ten billion humans lived in orbits, working in off-planet factories. The factories varied in their production, from food to asteroid mining vehicles. The remaining Earth's population was spoiled, and they intensely craved the off-planet resources. The high demand for space production created the Earth's first trillionaires, which controlled massive space factories. Many of these factories had millions of workers, and they were highly efficient.

Alder worked on the biggest solar farm in orbit—it spread out as far as his eye could see. The solar farm was nicknamed “Husun” because the human-made object looked like a miniature version of the Sun from Earth. It condensed solar energy by reflecting sunlight in space via millions of mirrors into a floating energy collector on Earth's Pacific Ocean. It was highly efficient and made up twenty percent of the Earth's solar energy collection. However, since space is very dusty, it was Alder's job to make sure that the solar mirrors were kept clean from the incessant buildup of cosmic dust, which hindered the ability of the farm to reflect light. If Husun wasn't working at maximum efficiency at all times, Earth's people would realize energy restrictions, annoying all of them.

Alder oversaw a team of “sun cleaners” that would work in groups of ten on two-hour missions cleaning the mirrors free of cosmic dust. Being a sun cleaner was not a sought-after job, but because of its importance, it was highly compensated. This was the only reason workers tolerated Husun’s dangerous conditions.

Alder lived in a space colony close to Husun, which held most people working there. In many respects, the colony resembled Earth. There were beaches, wildlife, and many stores. While it resembled Earth, it did not measure up in terms of living there, a natural paradise. Instead, exhausted workers returned to their cylindrical, metal pods. There was just enough room inside them to live and keep bare necessities. Pods with a window boasting a view of space were available for an extra fee.

Alder was relaxing in his room when he heard an alarm blaring from outside his room. He tried to ignore it, but it persisted. Alder noticed an oncoming headache and needed to get some fresh air. As he exited his room, his heart dropped. He looked up towards the colony’s sky, where massive screens displayed news feeds and advertisements.

“THE OUTER MIRRORS NEED CRITICAL REPAIR. REPORT TO YOUR POSTS IMMEDIATELY”, read the news feed in bold flashing letters.

The outer mirror was the part of Husun that always had the most problems, but was barely worked on due to the enormous distance workers had to travel to get there. This was dangerous, as they were far away from the center of Husun, called the Core. All outer mirror communication to the Core was drowned out by the noisy cosmic microwave background. The teams working there had to do so without the Core’s support.

Alder sprinted to the edge of the space colony, where quick space flights to the Core were held. Only entering the backside of the Core was safe, or else their rocket would burn into flames. He found his team and buckled up for a two-minute ride. Alder looked to his left and asked, "Do any of you know what happened? I just saw the alert and sprinted over here". His favorite and most skilled structural engineer, Ejnu, responded, "Not sure. It looks like there is a major fault in the outer mirrors. Those damn machines, they're ruining our day off!"

Until recently, the sun cleaners had to work seven days a week. However, the owner of the solar farm had recently made a massive investment in machines that would clean the vast array of solar mirrors. Their initial shipments had just arrived a month prior, but they still needed to be calibrated to properly clean the delicate mirrors without damaging or destroying them. The sun cleaners hated them, as they would eventually null the reason for human workers at Husun.

"I wonder what those machines look like...maybe they look like us?" pondered one of the workers. Their trip to the Core ended, and it was time to suit up.

The immense heat of the solar farm made it necessary for workers to wear sunsuits for safety. Sunsuits were reflective space suits with a completely blacked-out visor, designed specifically for keeping the workers safe. The harsh conditions near the solar mirrors were extreme, where temperatures measured up to 10,000 degrees Celsius. The suits did not have a visor, and workers saw through a digital display inside the helmet. This was required because one look close to the mirrors without protection would cause permanent blindness. Additionally, the helmet showed an advanced feed of the suit's stats, including a live temperature check and how long they had to get back to the base. Even with state-of-the-art

reflective and heat-reducing materials, the workers couldn't spend more than a couple of hours working, or their bodies would cook inside their own protection.

Once the team had suited up, Alder asked Ejnu for a status update of the situation. "A report just came in. One of those machines got space debris caught in their sweeper. The machine then continued sweeping and destroyed a whole section of mirrors", Ejnu responded. The structural engineer seemed to be especially galled, as this problem was his specialization. He would have never made this type of mistake.

"Well, it looks like we'll have to make a trip down there," Alder responded.

Immediately, his team of ten sun cleaners shouted in disagreement.

"It's too dangerous out there! The outer mirrors haven't had safety checks in the past decade!" exclaimed one.

"That's not fair! Why don't we leave it and let one of the other teams do it? I'm too tired to do this right now", shouted another.

Alder was in a difficult situation. He didn't want to do it or put his team at risk. However, he would undoubtedly be fired when he got back if he didn't resolve the problem. There was a shortage of other jobs due to autonomous systems swallowing human jobs. Being a sun cleaner was his only choice. The dilemma rattled around in his brain until he came to a quick decision. His team had to do it.

"We have to do it. We don't have another option," he sighed. "I know that it is our off day, but the people on Earth are depending on us."

The team shouted in protest, "They are living in paradise! They don't need all of this energy. One person down there uses more energy than 50 of us!".

The humans on Earth had the highest energy per capita rate usage in history, but they kept demanding more. To keep up with the demand from Earth and cut down on costs, salaries, and living conditions in space had been cut by Earth's trillionaire executives and bureaucrats.

Alder noticed an incoming call through his helmet interface. The call was from a Husun executive back at his house on Earth.

"Are you the manager in charge of the current cleaning crew? Looks like the outer mirrors are broken. The lights have dimmed here!" said the executive.

Alder confirmed that he was and that his team was actively working on it.

"What? I can't hear you. You know what? Just go and fix it. I'm busy. Do it fast, or I'll replace you and your cleaners," the executive added.

Beep.

After the call ended, it became apparent to Alder that the executive wasn't working. The loud noises that caused the executive to not hear came from a party. Alder updated his team on what the executive said. They groaned and finished suiting reluctantly.

While doing so, they went over the steps of replacing the mirrors. While in training, they were taught that the backside of Husun looked like a spider web, with thick metal beams connecting the mirrors to one another. Each support structure had a hook, which the cleaners would have to attach their locking device to and climb along. With every following array of mirrors, they would have to release the lock, without any other protection, and climb to the next hook. It was essential to pay close attention to making sure they were locked in at all times, or they would risk floating away into space. However, they couldn't go too slow. They had a

two-hour timer to get to the broken outer mirror, fix it, and return to the base. Once the team confirmed that they were all ready to go, Alder opened the door to space.

The journey started out easy. They were all focused, going quickly, and good on time. So far, all the hooks had been stable and in good condition. They had barely broken a sweat, and they kept trudging along.

Once the team was nearly at the edge, they noticed a sharp drop off in the quality of the support beams. Since the outer mirrors were harder to reach, they were replaced less often than those around the Core. Years of radiation and constant sun faded the metal structures on which the mirrors were held. They were also scratched heavily by the occasional trip to these parts of Husun, which meant that some of the hooks had tiny holes in them. Alder looked through his helmet's display at the bottom of the mirror that he was on, marked 2183. The panel was a half-century old, near the time Husun was built! This made his eyes open wide, and he noticed his heart rate increase. These structures were long overdue on their safety checks. Each mirror and support beam was supposed to be replaced every ten years. How long had it been since someone had been out here?

Alder decided not to tell his team about the age of the structures. He needed them to stay focused. However, he felt his hands starting to sweat, and he realized that they were lagging behind on time. He urged the team on.

"Look, that mirror has light shining through the backside! That has to be the broken one," exclaimed a worker near the front.

Alder looked at his helmet's interface display to confirm they were at the right location, but it was gone. They had officially traveled so far that their communication to the Core had been disrupted.

They were alone.

The team didn't have time to spare, so they got to work quickly. Each cleaner had a panel strapped on their suit, which measured a meter diagonally. Thankfully, the process of repairing the mirrors was quick, but they would have to take turns one by one installing their mirror. They would have to unlock themselves and float up to the front of their assigned mirror to replace. This was highly dangerous, and the temperature was nearly 10,000 degrees Celsius. Their sun suits could last about two minutes before melting.

Alder volunteered to replace his panel first, with the rest following behind. He climbed to the nearest hook of the structure and triple-checked that he had a secure connection. As Alder ascended, he couldn't help but notice how beautiful his surroundings were. He was at the edge of the Husun, something very few people had seen. It reminded him of a beach on Earth, where the sand was the mirrors, and space was the ocean.

Immediately, he felt the suit's temperature rise. His helmet notified him with a countdown—90 seconds. Plenty of time, he thought. As he passed the edge and climbed onto the mirrors, he saw the machine. Alder laughed as it was his first time seeing one of them. It was a cuboid piece of metal with sharp edges, a rotating sweeping bottom, and an assortment of blinking lights in the shape of an eye. He almost felt bad for the machine, lifeless and clueless but forced to work until the end of time. As he got closer, he became increasingly aware of its enormous size. He didn't know the exact measurements, but it was the largest machine he had

ever seen. He floated down towards the bottom of the machine, towards the part that swept away cosmic dust. He was surprised by how complex the system was. It had millions of tiny bristles, all rotating in sync, cleaning the mirrors skillfully. After a few rotations of the sweeper, Alder caught a sharp flash of a metal object stuck towards the bottom, which was ripping through the mirrors. The light was so immense near the panels that light leaked through the blacked-out visor, making it difficult to see the helmet display, but he was certain he saw it. Luckily the metal blade was not rotating too fast, and he quickly removed the space debris out of the sweeper. He took out his own mirror and unlocked four hatches at each corner. He let the destroyed mirror float off into space and attached his own mirror. It snapped in successfully, and he sighed with relief.

Alder had experience doing this before, but this was the most exhilarating and rewarding repair he had done. He looked at the timer and saw that he had over twenty seconds left. Plenty of time to return to his team. Alder grabbed onto his rope and climbed back to the metal structure his team was attached to, one pull at a time. By his estimates, the team would have enough mirrors combined to complete the job successfully. He climbed back over the edge of Husun and went underneath the mirrors. The temperature sensors dropped, and the timer went away. His job was done. He looked back at his team, and he smiled.

The team was there, pointing towards the support structure. They were floating away from the solar farm. Alder started laughing, and tears came down his face. In his tears, he saw the entire team's connection to Husun had been cut cleanly in half by the machine, which had another massive space debris shaped like a gigantic blade stuck. It had punctured through the mirrors and sliced away their support structure. This was the piece they were sent to remove,



not the one Alder removed. There was nothing that they could do—they had drifted too far away to climb back to Husun, and communication to the Core was impossible. Alder and his team drifted away into space, each eventually becoming soulless amongst the stars and cosmic debris.

It wouldn't be until a few hours later that someone realized that the crew was missing. The Core sent out another team, which repaired the outer mirrors successfully. Husun had gone back to maximum efficiency, and the Earth inhabitants rejoiced in the news that energy had been restored and went back to enjoying paradise.