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Black Hole

by Matias Travieso-Diaz

*My bounty is as boundless as the sea, my love as deep;
the more I give to thee, the more I have, for both are infinite.*
William Shakespeare, Romeo and Juliet, Act I.

1.

Chief Engineer Larch Aukai's sleep was cut short by the mechanisms that monitored shipboard conditions, which had initiated a very slow waking up process that would bring Aukai and other travelers in the *CS Elyseum* back to alertness.

For a long while, he felt torpid and confused. As awareness returned, his first thought was one of relief: their ordeal was over and the trip was only three months or less away from their destination, just enough time to carry out the activities necessary to prepare for landing. Once he became fully conscious, however, he realized there were distress signals coming from various systems in the spaceship. He got up and shuffled his way to the command and control room, the heart of the vessel.

The onboard navigation systems instantly showed him where the spaceship was, and he was not pleased. The New Ark expedition's target was Kepler-452b, a small planet tucked away in a corner of the galaxy. Kepler-452b was a near twin to the Earth and had been for centuries the subject of covetous attention by humans anxious to abandon the mother planet. It was, however, 1,400 light-years (seven thousand trillion nautical miles) away so that, even with the most

advanced spacecraft design available in the late twenty-fifth century, it would take the expeditioners fifteen hundred years to get there. By that time, life on Earth would surely have come to an end: the planet would be like an abandoned ship, looted, cannibalized and ultimately destroyed by its own inhabitants, circling silently around an indifferent sun.

Aukai looked at the chronograph on his left wrist and his heart skipped a beat. They had traveled for only 614 years, so they were way short of their destination. They had, however, gone well beyond the outer limits of the solar system and were literally in the middle of nowhere.

Why had their voyage been disturbed? The videos that recorded the progress of the trip had the answer: the ship had been bombarded by countless small meteorites travelling at very high speeds, some of which had penetrated the thick metallic skin of the *Elyseum* and had caused still unassessed damage. Together, the myriad impacts had also stricken the vessel like a powerful fist and had driven it off course. At the moment, the spaceship found itself in a relatively empty region of the cosmos, one devoid of stars; ahead, however, there was a faint far away light, and the vessel seemed to be progressing towards it.

Much of the flight crew and some of the passengers were awake and walking about in disarray. The Captain, Lord Thaddeus Stal, was at one of the navigation panels. Stal was an old apparatchik who, from the moment of his appointment as expedition leader by the rulers of the Righteous World Empire, had involved himself with every detail of the “New Ark” mission to Kepler-452b, from the species of plant and animal life that would be selected to the makeup of the crew and the fortunate passengers. He knew the mission better than any person alive; yet, at the moment he seemed as surprised as anyone at the unexpected turn of events.

“Have you figured out what happened, Aukai?” asked Stal.

“My Lord, it seems that several years ago, when we crossed the region of the Oort Cloud, we were struck by thousands of fast-moving meteorites and driven off course. The *Elyseum*’s outer skin absorbed most of the hits and the onboard systems have repaired the damage automatically, but some meteorites pierced through into the ship and made us start losing internal pressurization. We just reached a pressurization level low enough that it called for alarms to go off and revivals to be initiated.”

“Is the mission in any danger?”

“The repairs have already started, and flight can continue normally through a combination of redundant and backup systems. However...”

“However what?” asked Stal sharply.

“We are detecting ahead a strange energy source that radiates gamma particles and X rays into space.”

Stal was not much of a physicist. “What does that mean?”

Aukai tried to choose his words carefully, so as to convey the seriousness of the situation without causing undue panic. “Sir, one finds that type of radiation in the vicinity of a black hole.”

2.

Aukai and Amber, his wife of twenty-nine years, were on the flagship vessel, the *SC Elyseum*, and were among the first humans scheduled to set foot on Kepler-452b. Thousands of other colonists were aboard the two hundred and twenty-seven ships that would carry away the selected few people chosen for survival.

Shortly after the takeoff from the chosen departure points from Earth, Aukai and the passengers of all ships had gone into suspended animation, in cryogenically maintained

containers that preserved them unharmed in an environment extremely close to death but capable of returning them to a normal living state when needed. Thus, like barely alive mummies, they had traveled for centuries just to leave the confines of the solar system, a one-way trip for which there was to be no return.

3.

It was several hours before Aukai could return to the cabin he shared with his wife. As they sat next to each other in the flimsy plastic chairs sipping their first glasses of wine in years, Amber noticed the grim expression on his face: “What’s wrong, Larch? Is the damage to the ship serious?”

“We are better off than other ships in the mission. Two dozen were destroyed or quickly became depressurized from meteorite impacts. We are assessing whether we can transfer the crews and passengers of some ships that have been seriously damaged to others that are in better shape. It’s going to be messy for the next few weeks.”

“But the mission can continue, yes?” she pleaded.

“I hope so” replied Aukai lamely.

“What are you not telling me?” Amber knew her husband’s moods well, particularly his reluctance to give her bad news.

“We are having trouble ourselves changing course.”

“We are no longer headed for Kepler-452b?”

“No, and the direction in which we are going is worrisome.”

“Why is that?”

“There is a black hole in our path. Unless we can change course, we may be getting close to it in less than a month.”

“Why can’t we change course to steer away from it?”

Aukai grimaced. “We don’t know. The attitude control system of the *Elyseum* may be damaged, although they show no signs of malfunctioning. Or perhaps the gravitational pull of the black hole may already be too strong for us to get away from it.”

“Are you afraid?” Amber asked.

“Not for myself, but I fear what may happen to you if things go wrong.”

“I don’t fear death, for my life has already been filled to the brim with our love. Don’t worry about me.”

Amber said nothing else but clung to her husband seeking, or perhaps trying to provide, reassurance. They held each other in a silent embrace for a long, long time.

4.

Over the next few days, attempts were made to jerk the *Elyseum* into a different course by momentarily firing the fusion-antimatter nuclear pulse propulsion units while veering the spaceship away from the black hole, whose very dim luminescence grew a little brighter by the day. All attempts failed, and it became clear that the hole was holding the craft in a mortal embrace.

After the fifth day of fruitless maneuvers, Stal convened an emergency meeting of the crew. Without preamble, he summarized the situation:

“All but two of the ships on the fleet have managed to evade the attraction of the black hole and are attempting to resume the mission. Only the *Resolute* and us appear to be trapped. Our calculations show that we will be drawn into the hole in a few days, unless we can change course and steer away.

“I’m giving us a couple more days of trying to get free. If we haven’t succeeded by then we will launch the escape pods and radio the other ships to come back and pick us up. There is no guarantee we’ll survive, but here we are sitting ducks anyway. Any questions?”

There was a momentary pause and then a score of hands went up. Aukai was one of those with questions. His question was:

“Do we have enough escape pods for everybody?”

Stal gave him a nasty look. “We have one hundred and twenty pods, each with capacity for four people. So, we can accommodate four hundred and eighty evacuees. There are five hundred and thirty passengers and twenty-five crew members onboard the *Elyseum*. Seventy-five people will have to be left behind.”

A clamor of protests followed Stal’s announcement. He waited for the ruckus to subside and went on: “We’ll call for volunteers, and if there are not enough people willing to be left behind, we’ll draw lots for the rest.”

5.

Three days later, the situation was no better and the *Elyseum* was drawn into a hasty evacuation mode. Two passengers had died during the flight, so seventy-three passengers and crew had to be selected as sacrificial offerings to the black hole. Aukai, nine other crew members and five passengers volunteered to stay, and lots were drawn for the remaining fifty-eight spots. Amber was one of the volunteers; she resolutely rejected Aukai’s pleas to save herself: “My life is empty without you. If you stay, I stay.”

Contrary to the naval traditions, Stal refused to volunteer to go down with his ship and was not chosen in the drawing of the doomed. “I must survive to lead the New Ark mission to its destination,” was his excuse. He would be on the first escape pod to leave the *Elyseum*.

6.

Aukai and Amber watched, from the observation deck of a deserted command and control room, as the last escape pod issued from the *Elyseum*'s belly. "Will they make it?" asked Amber, undisguised rancor in her voice.

"I don't know" replied Aukai. "The pods were released pointing away from the black hole. The initial thrust of their engines may have been enough to overcome the gravitational pull of the hole; we never tried to compute their probability of escaping, since under the circumstances it would have been useless to learn the answer."

"I hate myself for wishing ill on others, but I'm hoping that Stal doesn't get away" declared Amber. Aukai was not in the mood to argue with his wife and squeezed her hand tightly, as they watched the pod fly into the cosmos' eternal night.

7.

A week later, very strong bursts of radiation from the black hole – ultraviolet, X rays, and gamma rays – began pounding the *Elysium*. The ship's radiation control systems had increasing difficulty in absorbing the radiation. Aukai made a risky decision and conveyed it to Amber.

"We are going to be zapped to death even before we crash into the black hole. I must go outside the ship on what we call an EVA and see if there is any problem that I can fix with the reaction wheels that control the spacecraft's attitude."

"Hasn't that been tried before?" she replied, in surprise.

"There was nothing in the control room readings to indicate the reaction wheels were malfunctioning. The activation signals were sent to them, and they registered normal responses. Since there was no apparent problem with the wheels, and out of fear of radiation exposure, Stal would not let anyone go outside to muck with them."

“And you think they may be out of order, despite giving no indication that there is anything wrong with them?”

“It is a very long shot, but I can think of nothing else to do.”

“And why do you think you might be able to fix them if they are broken?”

“I don’t know that I will be able, but again we have nothing left to lose.”

“I see. Well, suit up, but please be very careful.”

8.

There was a porthole in one of the *Elysium*’s corridors from which Amber could get a view of her husband, dressed in an EVA space suit and tethered to an exit door, as he laboriously fought the strong gravitational pull of the black hole and crawled along the surface of the ship towards the metallic pedestal to which the array of winged reaction wheels was bolted. He could see Amber watching out and waved at her as he turned on a head lamp and extracted a combination wrench-screwdriver from a pocket of his suit.

Five minutes later, he raised his arms and held in one hand a small rock, the size of a chicken egg, and mimicked that he had dislodged it from the shaft of one of the wings of the wheel. He was still waving in triumph when the wings started turning rapidly. One of them struck Aukai on the helmet, throwing him off balance.

Aukai tried to straighten up and, in attempting to do so, began floating away towards the black hole. The tether extended to its full length and the tension of the cord for a few moments fought the gravitational attraction of the hole. At the end, the tether snapped.

Amber watched in horror as Aukai tumbled away and was drawn inexorably towards the black hole. The outline of her beloved became smaller as he approached, ever so slowly, the accretion disk that surrounded the hole. Quantum effects gave rise to streams of hot particles that

radiated back out into the void from the disk, bombarding the astronaut. Aukai's body reached the event horizon at the edge of the hole and seemed to become suspended there.

As he traversed the event horizon and disappeared into the black hole, Aukai went into free fall, feeling no pain or burning sensation. He was being sucked towards the center, and would have been unable to head back if he had tried: doing so would have required reversing time, an impossibility even in such an impossible place. He was being strained through an ever-narrowing funnel that would eventually, at some point in an unmeasurable future, reach the singularity at the center of the hole, the place where time, space and self no longer existed.

9.

With its attitude modified to point away from the black hole, the *Elysium* engines strained to their maximum capacity and finally veered very slowly from their fatal course. The space ship was re-boarded days later by Stal and the escape pod fugitives. They had nearly starved to death but were eager to return to the relative comfort of the ship. Amber greeted them with little showing of affection and received their condolences stonily.

The mission was reorganized with a reduced number of ships and colonists and relaunched. It reached Kepler-452b some seven hundred years later and became New Ark, the first successful Earth transplant into the far outer space.

Calling New Ark a successful transplant of old Earth was a perhaps too accurate a characterization. Within a couple of generations, the greed, intolerance, and ignorance that had plagued the old Earth resurfaced and the colony eventually plunged into chaos, as had its predecessor.

10.

Amber refused to go back into hibernation and remained a solitary grieving figure in the midst of slumbering colonists onboard the *Elysium*. She died alone, and her desiccated corpse was only discovered many years later. Tales of her ghost haunting the ship were repeated by many generations of New Ark colonists.

Aukai, for his part, continued to lament their separation, and did not stop thinking about her until he disappeared into the singularity at the end of the black hole. Thus, both lovers mourned for each other simultaneously, and in a fashion their romance was to continue for as long as one or both were capable of thinking, remembering, and feeling joy and sadness at the memory of their shared existence.

She had grieved for the remaining years of her life. Aukai, perhaps, did so forever.

THE END