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A Journey to Planet K2-18b

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"Cyril, wake up! We're almost there!" shouted Sarath. The ship's alarms blared through the corridors, summoning everyone to their stations. Through the massive observation window, unshielded the faint glow of a red dwarf star shimmered in the distance. And just ahead lay our long-awaited destination: the planet K2-18b. As a crew member and astrobiologist on board, I had just awakened from my hibernation pod, preparing for the adventure of a lifetime.

Our ship, Interstellar, was named after the iconic 21st-century sci-fi film. Now, nearly a hundred years later, we have travelled more than a hundred light years from Earth. Sarath, our chief engineer, and Chandra, the ship's physicist, were among my closest companions. Though we hailed from different disciplines, we shared a common purpose: an insatiable curiosity and a vision for a better future for humanity.

I was only 28 when we left Earth. Our hibernation pods had significantly slowed our aging, preserving our health during the long voyage. Back then, the discovery of extraterrestrial life had been hailed as the scientific breakthrough of the decade. K2-18b was identified in 2015, just one year after Interstellar was released, what a coincidence. A decade later, scientists detected Dimethyl Sulfide (DMS) and Dimethyl Disulfide (DMDS) in the planet's atmosphere; gases typically produced by marine phytoplankton and bacteria, strong evidence of life. Although technology at the time was not yet ready for space colonization, the space industry was accelerating fast. Reusable rockets had already begun reducing the cost of space travel, but reaching even 1% of light speed remained a formidable challenge.

Before departure, we were equipped with a radio-photoautotrophic biofilm embedded into our skin via a hydrogel matrix (Fig. 1). This innovative biological suit provided life support by shielding us from radiation and generating oxygen.

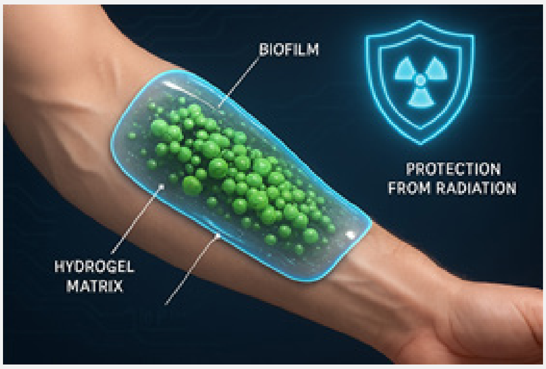

Fig. 1: AI-generated illustration of a radio-photoautotrophic biofilm embedded into skin via a hydrogel matrix.

Now, after our long journey, the Interstellar had entered orbit around K2-18b, and the crew buzzed with excitement. The planet, 2.37 times the size of Earth, orbits an M-type star, smaller and redder than our Sun. "Ready?" Sarath asked, checking his holographic watch. "Hope so," I replied, gripping my seat as the ship shook violently during atmospheric entry. The turbulence eased as we descended into the calmer layers of the atmosphere. It was nightfall, and the alien landscape glowed under the faint light of its distant star. Our ship touched down smoothly, powered by reverse thrusters. It was a moment of awe, fear, and exhilaration; humans had set foot on a planet beyond the solar system, and not just any planet, but one with signs of life (Fig. 2).

Fig. 2: Humans had set foot on a planet beyond the solar system with signs of life.

The surface looked unfamiliar. There were no tall plants or trees, only tiny vegetation clinging to shaded areas. K2-18b appeared to be in the early stages of biological evolution. We saw nothing edible, no fruits, no grains, no visible signs of developed ecosystems. “This planet doesn’t seem to have much to offer in terms of food,” I said. “If we’re to build a base here, we’ll need a steady food supply, fast,” Sarath replied gravely. Growing food on alien soil posed a massive challenge. The planet’s substrate likely lacked essential nutrients and native microbial communities compatible with Earth crops. Anxiety rippled through the crew as we faced the harsh reality. “We’ll grow our own food,” I said firmly after a long pause. Chandra, calculate the greenhouse area required to sustain the crew. Our first step was to adapt the soil. I directed the team to apply our engineered biofilm to the ground. Designed to enhance microbial diversity, increase nutrient cycling, and detoxify contaminants like heavy metals and perchlorates, the biofilm would create a more Earth-like ecosystem to support plant growth.

But the atmosphere posed an even greater challenge. It was significantly thinner than Earth’s and allowed in high levels of ultraviolet radiation. “At this rate, it would take millions of years for the planet to develop an ozone layer like Earth’s,” Chandra noted after his calculations. Our oxygen reserves were also dwindling. Time was not on our side. Yet, we had a solution. “I want every sunlit wall of the base covered with the radio-photoautotrophic biofilm,” I ordered. Our habitat’s transparent architecture was ideal for this integration. The biofilm, designed to adhere to surfaces and generate oxygen while providing UV protection, was a critical lifeline.

In just a few weeks, we made astonishing progress. The fusion of advanced microbial biotechnology and cutting-edge engineering enabled us to establish a sustainable habitat. As we stood beneath the pale light of a distant star, watching an alien world slowly transform under the touch of Earth-born science, we understood that this was more than survival, it was a new beginning. K2-18b was no longer a far-off dream. It was becoming our second home.