T00111

INTERNATIONAL SPACE APPS CHALLENGE

COCONUT

SOORYAKRISHNA M
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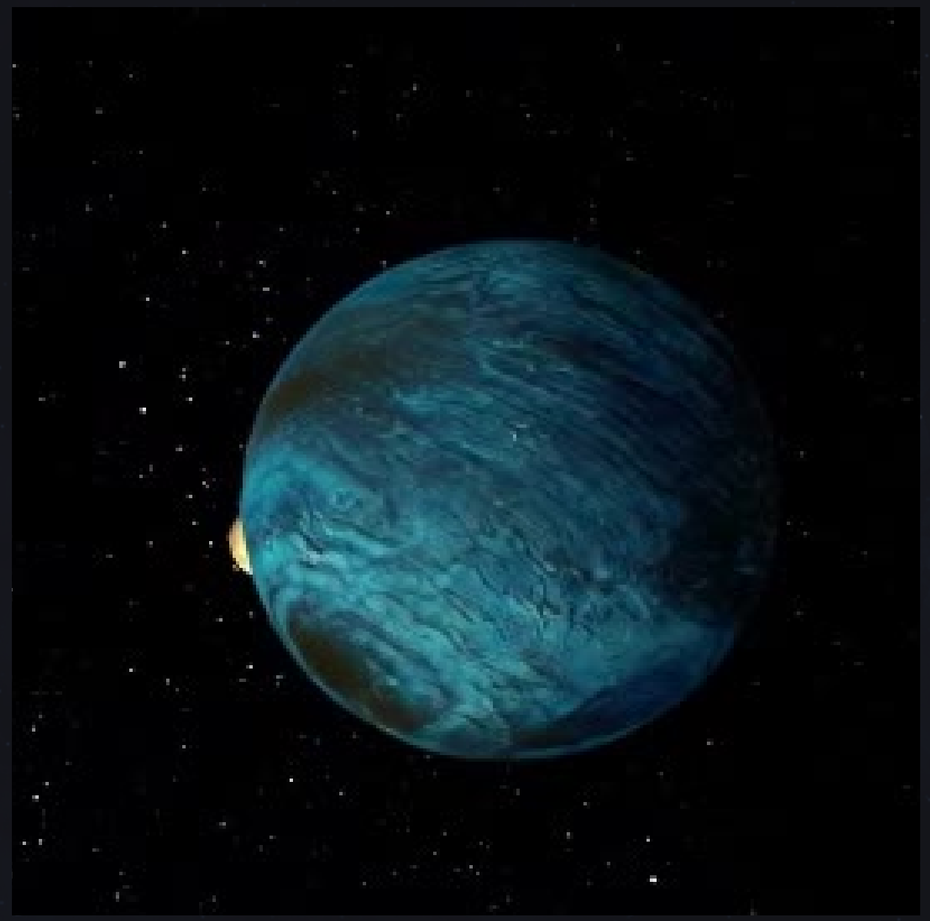
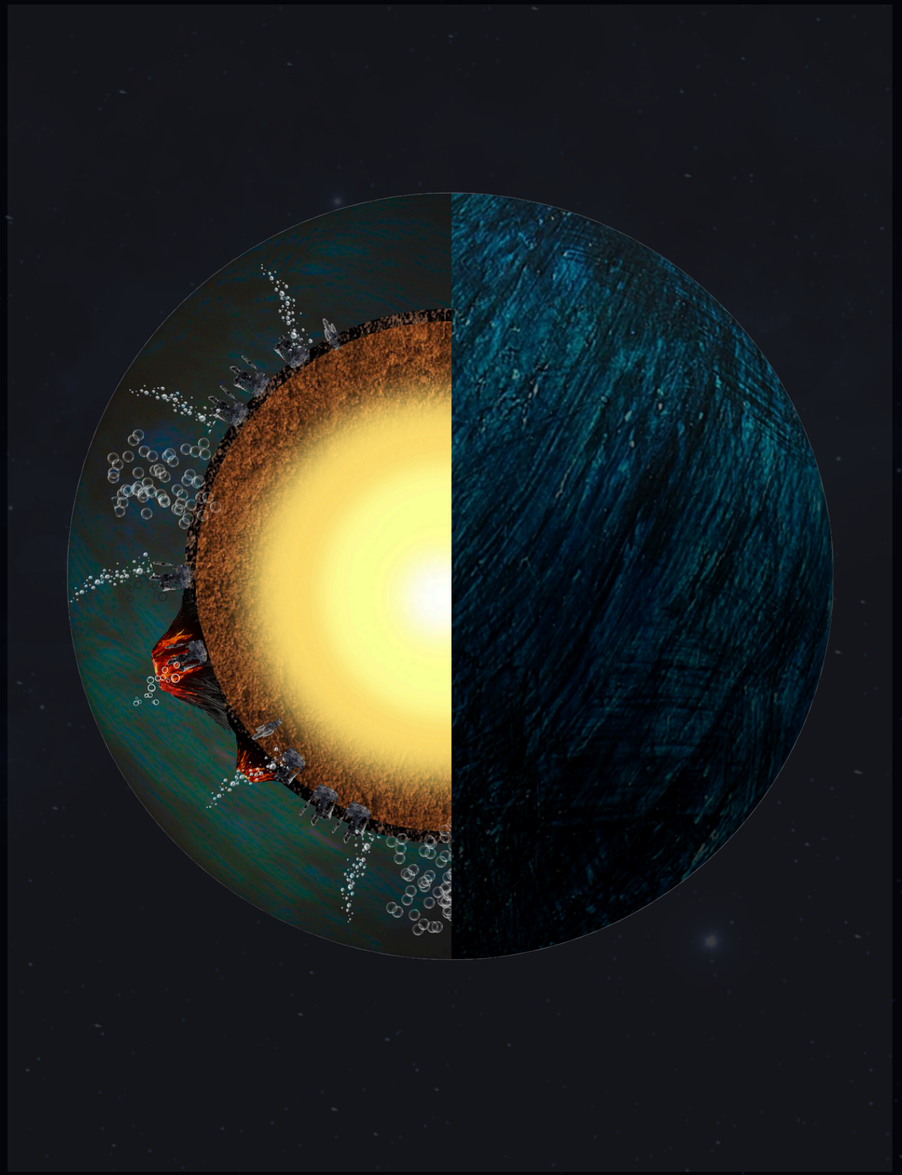


ORIGIN

Eons ago, a cataclysmic event shook the outer edges of the galaxy. A dying star's explosion scattered its remnants across the void, and from the debris, an isolated, cold planet was born—a world where light never touched the surface. In the unbroken sea, Gigantic hydrothermal vents broke through the seabeds, releasing clouds of hydrogen sulfide and carbon dioxide, feeding the atmosphere above. These vents became the planet's lifeblood. Over time, volcanic gases filled the dense atmosphere, but ancient chemical reactions with ferrous iron in the planet’s oceans gradually consumed much of the sulfur. Life in its most primitive form clung to the hot, mineral-rich waters near the vents, building a slow but resilient ecosystem in the abyss. Deep within this world of eternal night, where even the stars were forgotten, a strange new life had begun to take root—its future a mystery

INNER SIDE

But how did life come to exist on such a planet, where sunlight never reaches? The answer lies in the ocean depths. T00111 is home to powerful hydrothermal vents, spewing **iron and sulfur** into the oceans. These vents are the heart of the planet's ecosystem, releasing vital chemicals that organisms use to survive. On Earth, life is sustained by photosynthesis. Here, on T00111, life is sustained through **chemosynthesis—** a process where organisms feed on sulfur compounds, using them as an energy source."
"The ecosystem has adapted to the abundance of **hydrogen sulfide (H_2S)** and **Fe^{2+}** ions, creating a balance between life forms and the chemical reactions shaping their existence. Over time, the sulfur in the atmosphere has decreased as **Fe^{2+} ions** react with **H_2S**, forming iron sulfides and contributing to a more stable environment for the life that has flourished



WHY THIS?

At the heart of the planet’s surface stood a giant volcano, always active, constantly reshaping the atmosphere. With every eruption, it released powerful gases like water vapor (H_2O), carbon dioxide (CO_2), sulfur compounds (H_2S, SO_2), methane (CH_4), and iron ions (Fe^{2+}). This volcanic activity played a crucial role in keeping the planet’s oceans warm, even without sunlight, and helped support the unique lifeforms below.

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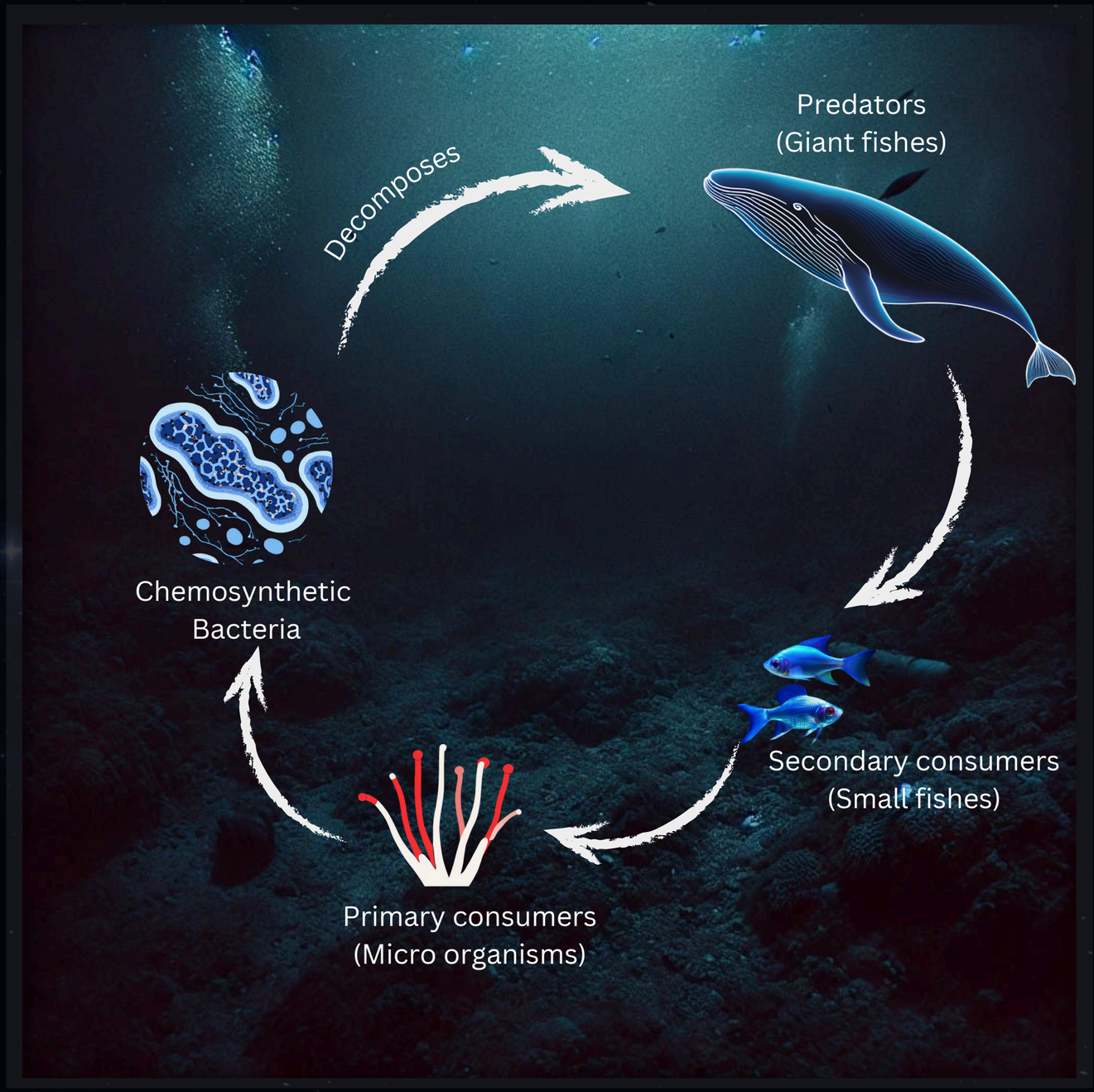
THE CREATURES OF XYLARIS: GLOWING GIANTS AND MICRO WONDERS

- BIOLUMINESCENT BACTERIAS
- HYDROTHERMAL VENTS BENEATH THE OCEAN
- BIOLUMINESCENT ORGANISMS FROM MICROBS TO GIANTS

FOOD CHAIN



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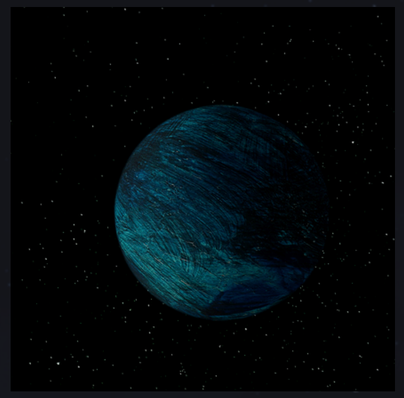

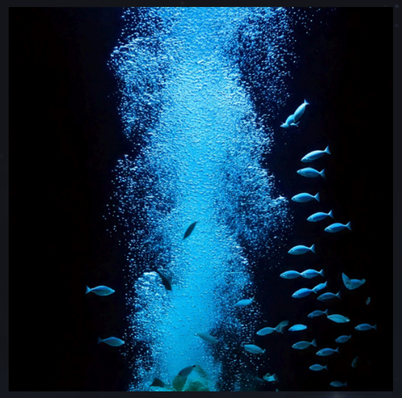

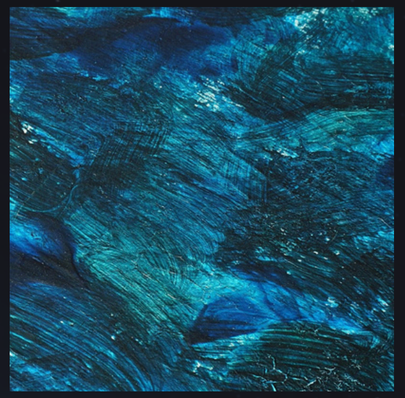

PLANETARY STRUCTURE

- The planet's geology is dominated by a vast ocean covering its entire surface, with no continents or visible land masses. Beneath this global ocean lies a dynamic, active mantle similar to Earth's, where tectonic activity is the primary force shaping the ocean floor.
- The planet's crust is thin and highly fractured, allowing molten rock from the mantle to rise easily to the surface in the form of hydrothermal vents, which are scattered across the ocean floor. These vents act as the primary heat source and chemical supply for the planet’s ecosystem.

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