India to Study Life Sustainability in Space under BioE3 Mission

Source: PIB

The **Union Minister of State for Science & Technology** announced that **India will conduct its first biological experiments** aboard the **International Space Station (ISS)** to explore the **sustainability of human life in space.**

- Led by **ISRO** in partnership with the **Department of Biotechnology (DBT)**, these experiments will be **part of the upcoming ISS mission, AXIOM-4** under the **BioE3 (Biotechnology for Economy, Environment & Employment) policy.**
- **Axiom Mission 4** is a private spaceflight to the ISS, operated by the US-based company **Axiom Space**.
    - Scheduled for launch in **June 2025**, the mission will also carry **2 Indian astronauts** from **ISRO** to the ISS.

Experiments Proposed in Space under BioE3 Mission:

- **Edible Microalgae in Space:** This experiment will check **how microgravity affects the growth of edible microalgae,** which are rich in **proteins, fats**, and useful compounds.
    - These algae can be used as **food in space** and also help **clean the air** by taking in CO_2 and giving out O_2.
- **Spirulina and Cyanobacteria:** This study will test how **cyanobacteria** like **Spirulina** **grow in space using two types of nutrients**- **urea** and **nitrate**.
    - It will help scientists understand **how to recycle waste (like carbon and nitrogen) from humans** to support life in space.
    - **Spirulina,** which is a **protein-rich, antioxidant-packed blue-green algae,** is also being tested as a **“superfood”**.

BioE3 Policy (2024)

- **BioE3 Policy** promotes **high-performance biomanufacturing** to support a **circular bioeconomy** and India’s **Net Zero goals**.
    - It focuses on **innovation, Bio-AI hubs, skilled workforce development**, and **sustainable biotech solutions.**

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