T Chamaeleontis: Organic Chemistry in Young Stars-2025

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- **The Basics: T Chamaeleontis (T Cha)** is a low-mass, Sun-like young star located about **350 light-years** away. Astronomers using NASA's **James Webb Space Telescope (JWST)** recently detected **Polycyclic Aromatic Hydrocarbons (PAHs)** in its planet-forming disk.
- **Background (The "Lifting Veil" Event):**
- Normally, the dense inner wall of the dust disk around such stars blocks ultraviolet (UV) light, making these molecules invisible.
- In 2022, a sudden burst of material falling into the star caused the **inner wall to partially collapse**. This "lifted the veil," allowing UV light to hit the outer disk and light up the PAHs.
- **Significance:** This is one of the lowest-mass stars where PAHs (complex organic molecules and precursors to life's chemistry) have been found. It proves that the building blocks of life are resilient and can survive even during the chaotic stages of planet formation.
- **UPSC Insight:** Focus on the role of the **Mid-Infrared Instrument (MIRI)** on JWST and the concept of **protoplanetary disks**.