

NASA Tests 8 Rotor Dragonfly Drone Destined For Titan

Why In News

- NASA is building a **nuclear-powered lander** for **exploring Titan** -- Saturn's largest moon having a dense atmosphere and low gravity.
- But well before NASA's Dragonfly rotorcraft lander soars through Titan's skies, researchers on Earth — led by the Johns Hopkins **Applied Physics Laboratory (APL) in Laurel, Maryland** — are making sure their designs and models for the nuclear-powered, car-sized drone will work in a truly alien environment.



Mission Dragonfly

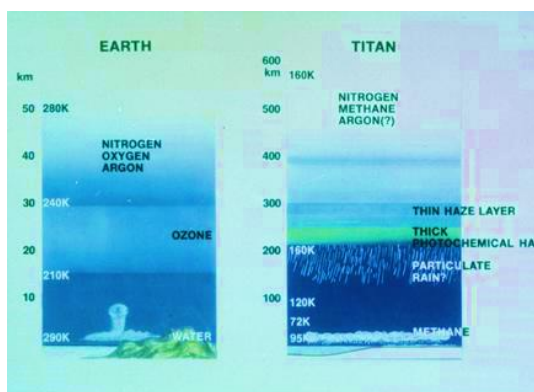
- NASA testing its Dragonfly rotorcraft to ensure it works as intended on **Saturn's moon Titan**. Dragonfly, NASA's **only mission to the surface** of another ocean world, is designed to investigate the complex chemistry that is the precursor to life.
- The Dragonfly mission is a spacecraft designed to explore the alien world of Titan, that has been in development in one form or another for over twenty years now.
- There are **eight rotors on the car-sized probe**, that is powered by a nuclear source. Dragonfly has been designed to hop between locations, allowing scientists to study multiple sites.

- NASA is testing its Dragonfly rotorcraft to ensure that it performs as expected on the Saturnian moon of Titan.
- Dragonfly uses four pairs of coaxial rotors, where one rotor is stacked on top of another in each pair.
- The approach will allow the blades to slice through the nitrogen-rich atmosphere of Saturn's largest moon. NASA engineers are evaluating the performance of the spacecraft in tunnels at the Langley Research Center in Hampton, Virginia, USA, in unique facilities that are capable of simulating the atmosphere of Titan.
- Dragonfly spacecraft is headed to Titan, on a **mission currently slotted for 2027**. The spacecraft has vertical takeoff and vertical landing capabilities (VTVL), and will be able to visit multiple sites on Titan.

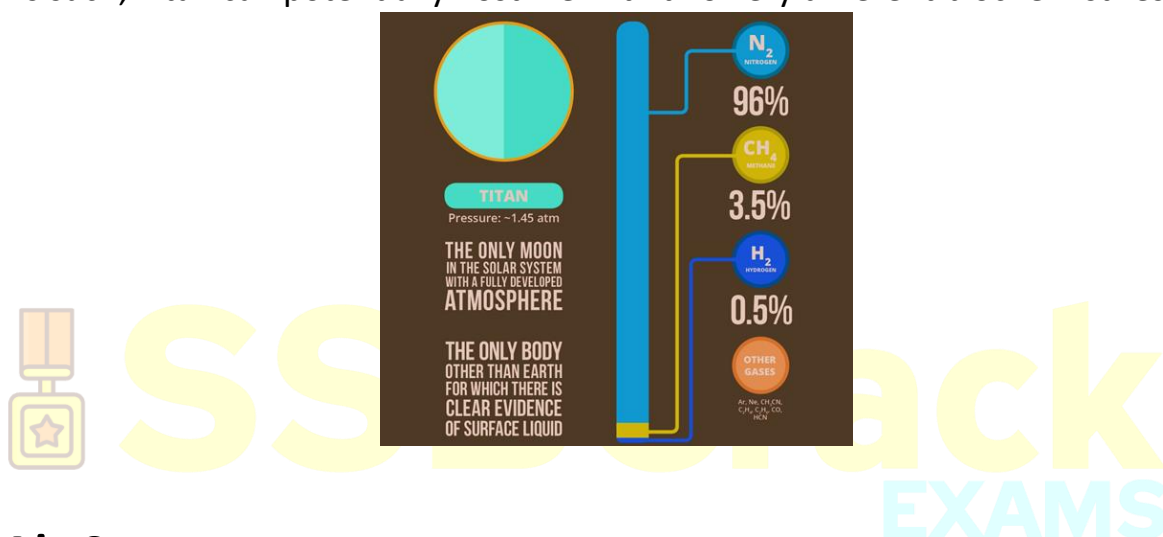


Titan's Atmosphere

- Titan is the **only moon** in the Solar System with a **thick atmosphere**, as well as liquids on the surface.
- Instead of water, Titan has **hydrocarbon seas**, as well as rivers, ponds and lakes made up of methane and ethane.



- The atmosphere is rich in chemically **active carbon compounds**. As such, Titan can support a hypothetical form of biochemistry where organisms can use the hydrocarbons as solvents instead of water, breathe hydrogen gas instead of oxygen, and use acetylene instead of glucose as a power source, producing methane instead of carbon dioxide.
- Titan also has a **subsurface liquid water ocean**, which may have interacted with the hydrocarbon seas on the surface in the past. The subsurface ocean may host carbon based life forms that use water as a solvent, breathe oxygen, use glucose as a power **source and produce carbon dioxide**, just like the organisms on Earth. As such, Titan can potentially host life with two very different biochemistries.



NASA's Say

- Dragonfly is currently scheduled to launch in 2027 & will reach the ocean world, Saturn's largest moon, by 2034.
- "With Dragonfly, we're turning science fiction into exploration fact," Hibbard said. "The mission is coming together piece by piece, and we're excited for every next step toward sending this revolutionary rotorcraft across the skies and surface of Titan."

