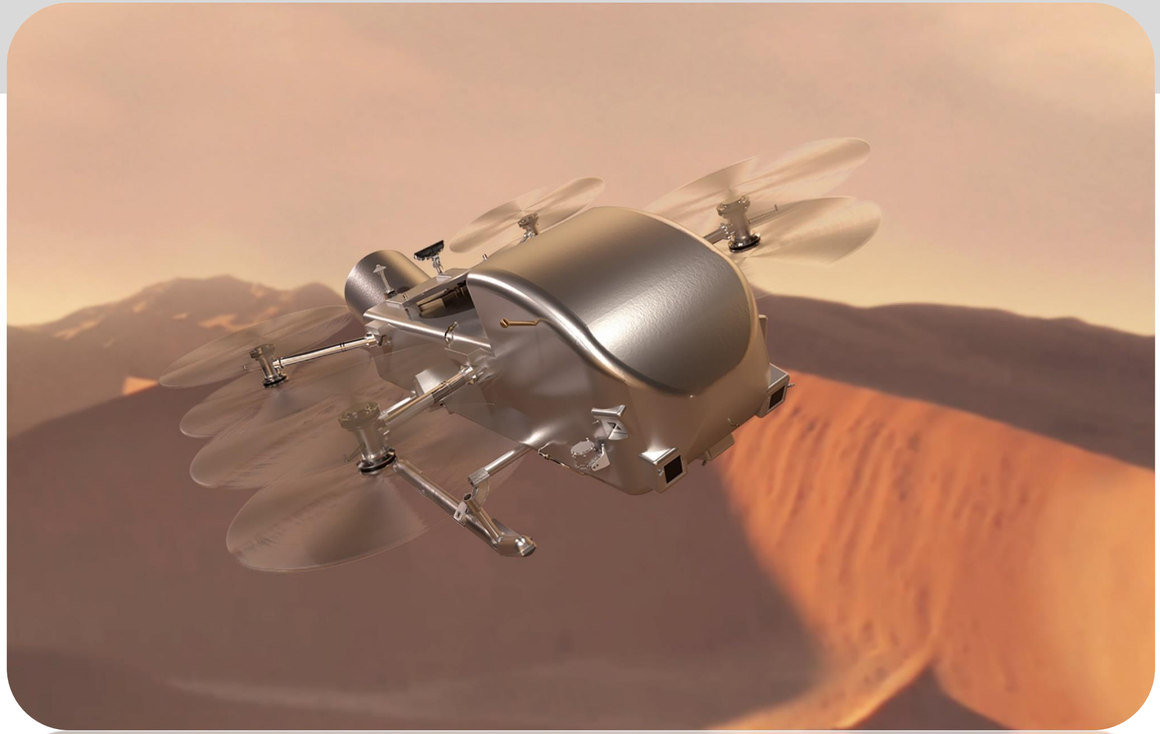
DRAGONFLY TITAN

Game Simulation

NASA Dragonfly mission, which will fly a drone-like craft around Saturn’s largest moon, Titan.



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NASA

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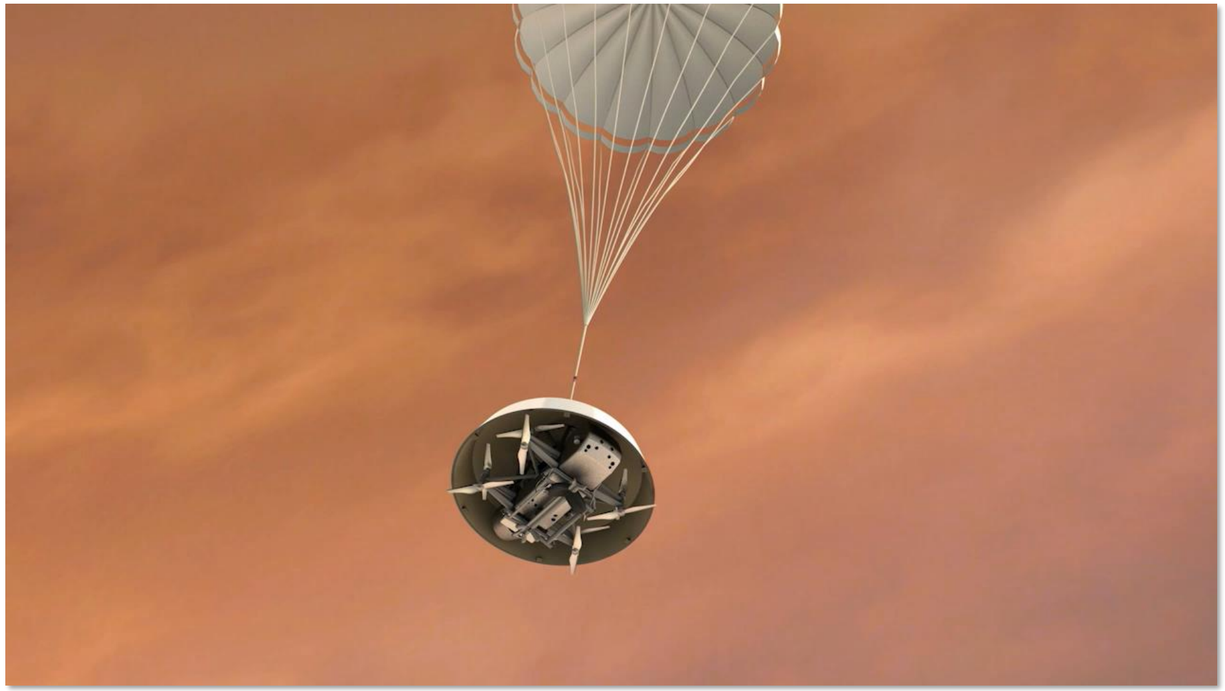
MISSION

NASA will send a rotorcraft lander to Titan to explore and search for chemical biosignatures; investigating the moon's active methane cycle; and exploring the prebiotic chemistry currently taking place in Titan's atmosphere and on its surface

MISSION DETAILS

- Launch: 2028 (July 5, 2028, to July 25, 2028)
- SpaceX Falcon Heavy rocket
- Mission is coordinated by:
  - The Johns Hopkins University Applied Physics Laboratory LLC
  - NASA



MISSION GOALS

- Explore various terrains including organic dunes, impact craters, and potential liquid methane lakebeds
- Search chemical indicators that could suggest past or present life, either based on water or hydrocarbons
- Study Titan's atmosphere to provide insights into its composition and potential weather patterns

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WHY GO TO TITAN

- Titan is the only moon with a thick atmosphere. Titan atmospheric pressure is about 60 percent greater than on Earth
- Titan’s nitrogen atmosphere is so dense that a human wouldn’t need a pressure suit to walk around on the surface.
- The Cassini spacecraft’s and The European Space Agency’s Huygens probe suggested the presence of an ocean 35 to 50 miles below the icy ground (likely mixed with salts and ammonia).
- The discovery of a global ocean of liquid water adds Titan to the handful of worlds in our solar system that could potentially contain habitable environments.
- Titan could potentially harbor environments with conditions suitable for life

Key Factors

Discovered: March 25, 1655

Type: Icy Moon

Diameter: 3,200 miles (5,149.4 kilometers)

Orbital Period: Nearly 16 Earth days to complete a full orbit of Saturn

Length of Day: Nearly 16 Earth days

Mass: 1.8 times Earth’s moon

Temperatures: -290F

Gravity: 14% of Earth's gravity (Little less than the Moon)

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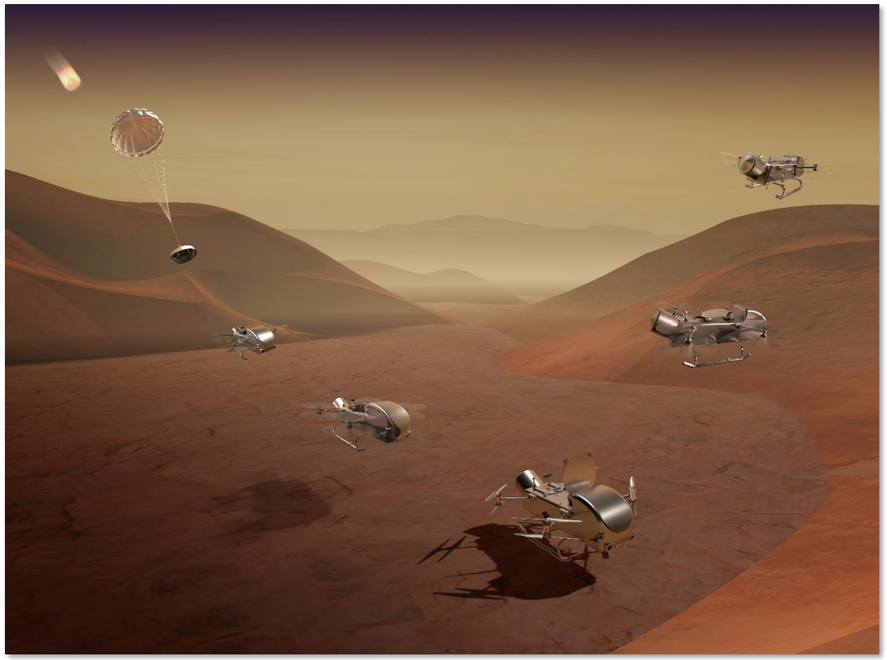
DRAGONFLY TITAN - SIMULATION PROJECT

Game Title: Titan Explorer
Genre: Exploration / Simulation
Platform(s): PC (VR optional)
Game Engine: Unreal Engine or UNITY
Game Physics: The simulation must show realistic atmospheric conditions such as gravity, visibility, terrain, methane fluids, etc.



Simulation Overview

DRAGONFLY TITAN is a single-player drone simulation game set on Saturn's largest moon, Titan. The player takes control of a NASA-designed drone tasked with exploring the alien landscape of Titan, scanning its surface, and gathering data for scientific research. The player must navigate the drone through the moon's harsh atmospheric conditions, including methane rain, low visibility, strong winds, and asteroid showers, while managing the drone's power levels and ensuring safe landing zones to recharge or avoid damage.

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DRAGONFLY TITAN - SIMULATION PROJECT

Simulations Goals

<u>Stay as close as possible to the real mission</u>:

- Controls (Coordinates System, Touch screen slider UI)
- Navigation
- Landing Procedure

Key Features:

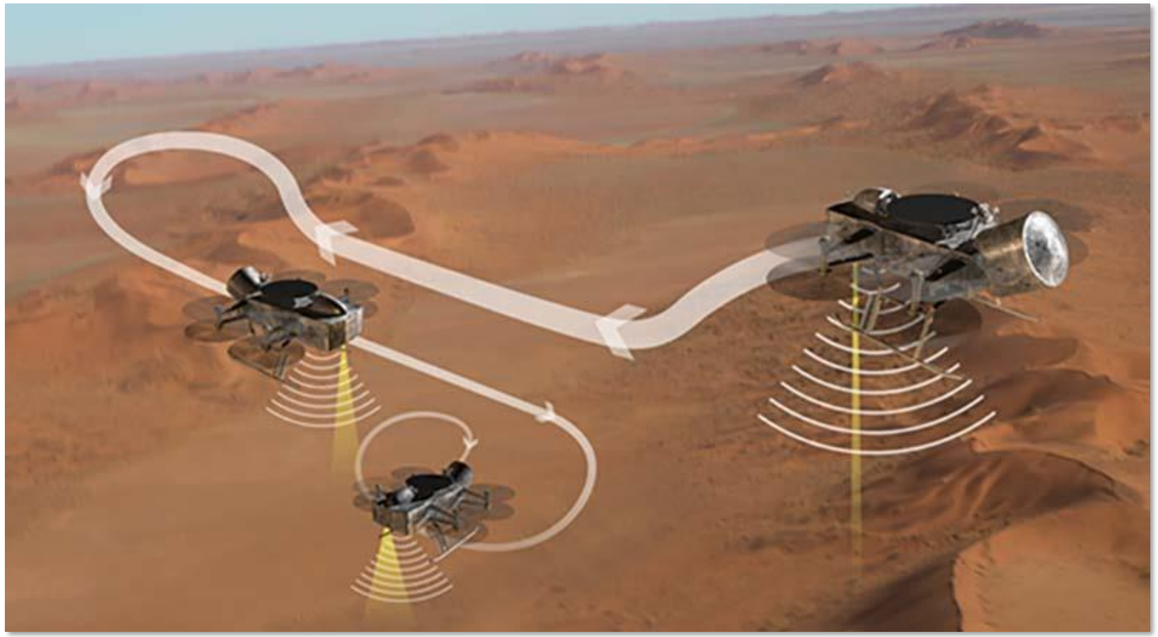
Realistic Physics & Atmospheric Effects: The game will implement real-world physics based on Titan's low gravity and dense atmosphere. Flight dynamics are affected by wind, storms, and rough terrain or proximity to hazards.

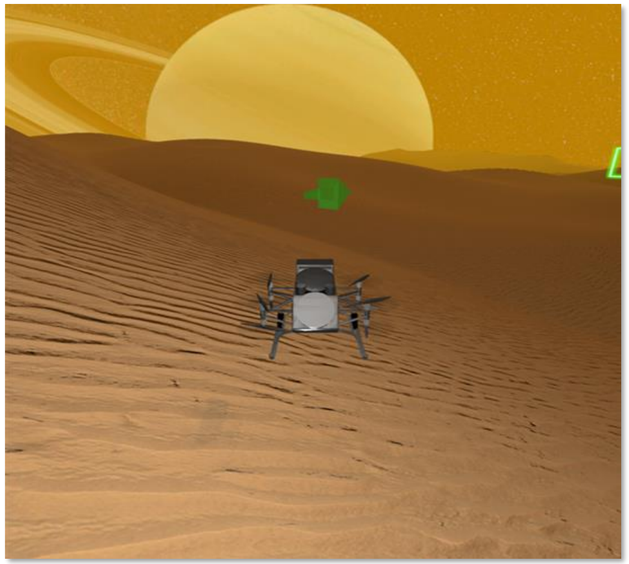
Topological map: The Topological map will show each mission goals and possible landing zones. It will show the available areas to fly, the areas that can be un-lock with the progression of the game.

Power Management System: The player must constantly monitor the drone's power levels, factoring in flight time, extreme weather conditions, and environmental recharge points.

Dynamic Scanning & Data Collection: Each area the player explores has scientific significance. Players will scan specific objects and environments for research points. Different biomes will have different data categories to collect, pushing the player to explore more challenging regions.

Landing Zones & Survival: Finding safe and strategic landing zones is key to the game. Some areas offer abundant solar energy, while others might offer geothermal energy for a quicker recharge but are riskier to access due to rough terrain or proximity to hazards.





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Resources:

NASA
https://science.nasa.gov/mission/dragonfly/

The Johns Hopkins University Applied Physics Laboratory LLC
https://dragonfly.jhuapl.edu/index.php

Scan this code with your phone's camera to view in AR

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