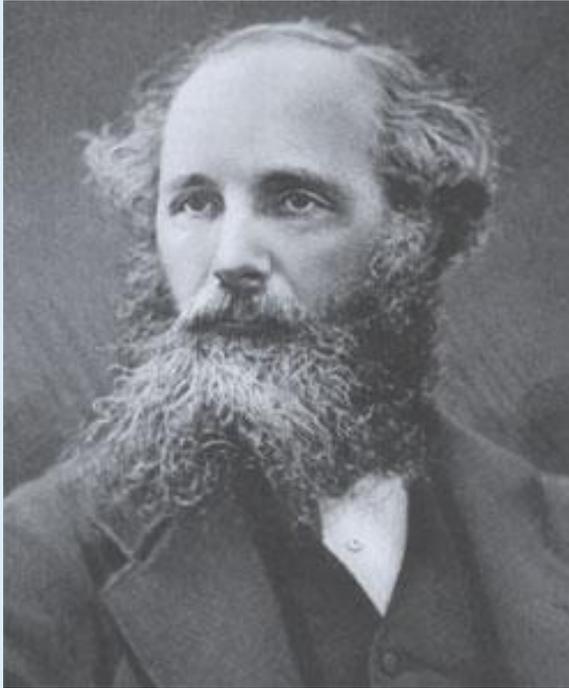


SOLAR SAILS

An alternate approach to propulsion

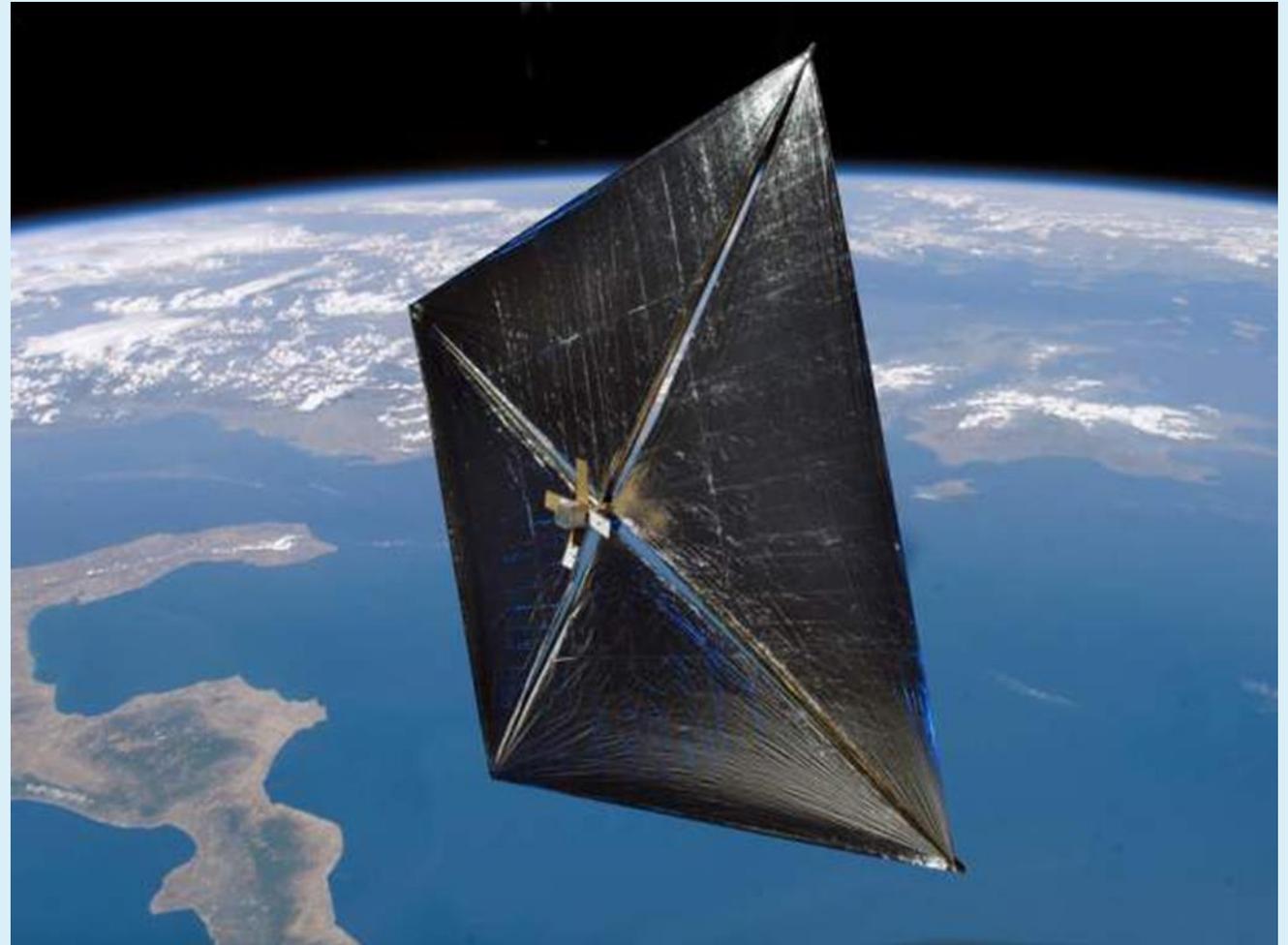
Origins



- In 1865, physicist James Maxwell proposed that light, as a form of electromagnetic radiation, is capable of exerting pressure on other objects.
- This pressure, however slight, would be enough to propel an object forward in space, provided that it was light enough.

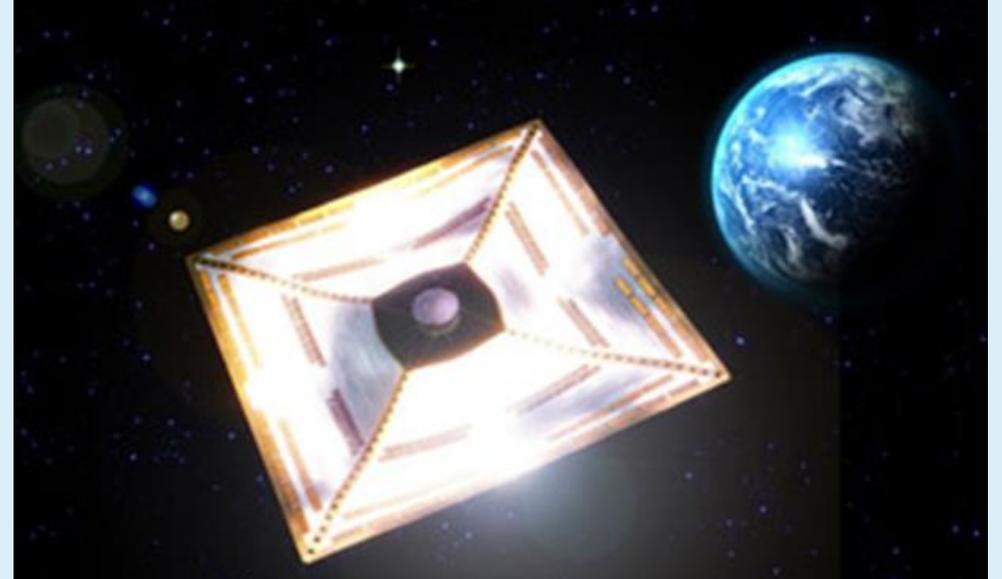
Solar Sails: An Overview

Large, “sails” made of thin, lightweight material, usually a polyester film.



Use for Space Travel

- When attached to a spacecraft, solar sails reflect photons from sunlight.
- Momentum from the photons places pressure on the sail, propelling it through space.



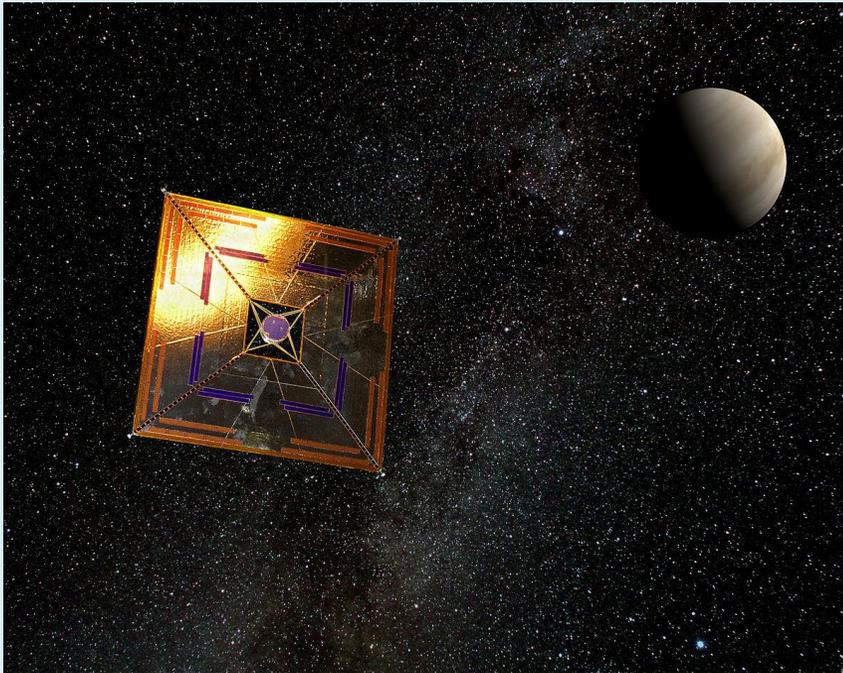
Benefits

Eliminates need for onboard propellant:

- Reduces cost
- Reduces mass
- Increases longevity of mission



Current Applications



- Japan's 2010 IKAROS mission marked the first successful use of solar sails as propulsion while travelling to Venus.
- After a failed first launch, NASA successfully deployed a solar sail in low-Earth orbit as part of the 2010 NanoSail-D mission.

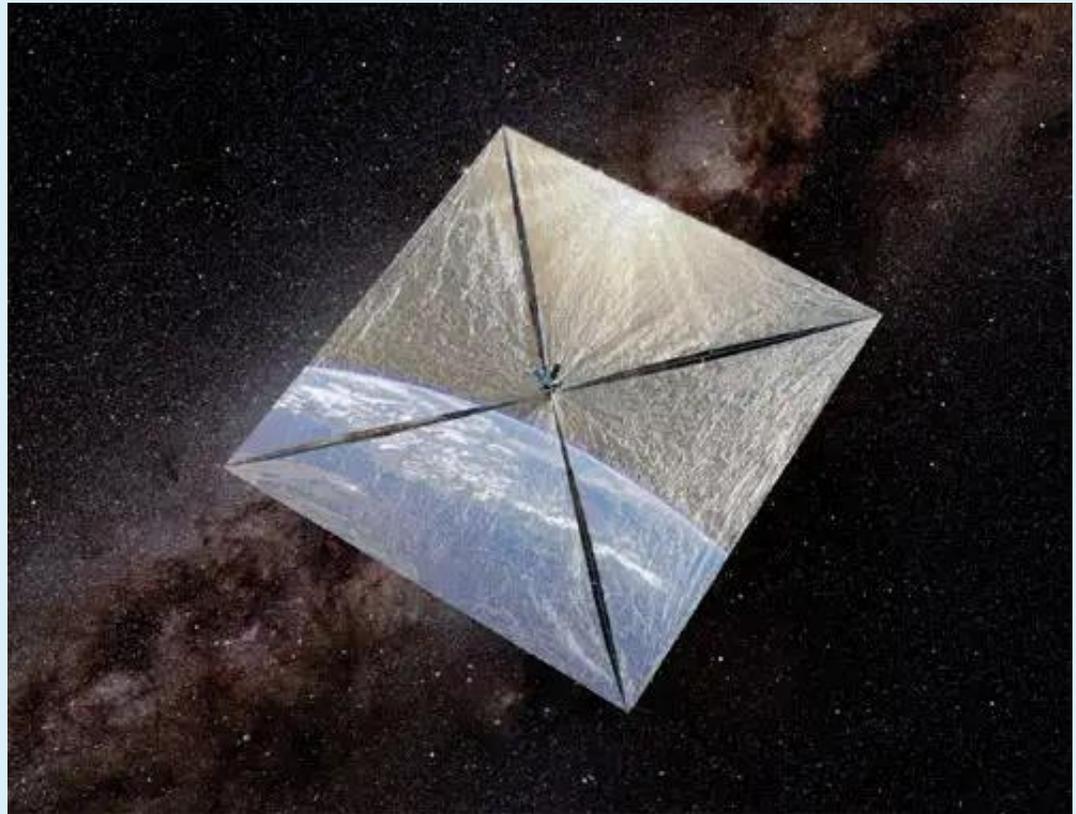
Near-Future Application

- NASA is planning to use solar sail propulsion on the upcoming Near Earth Asteroid Scout probe, which will study neighboring asteroids as a part of the 2020 Exploration-1 mission.



Future Application

- Solar sails could potentially travel to the far reaches of the solar system, and possibly beyond.



Questions?

