Solar Sail Propulsion Technology for Planetary Missions

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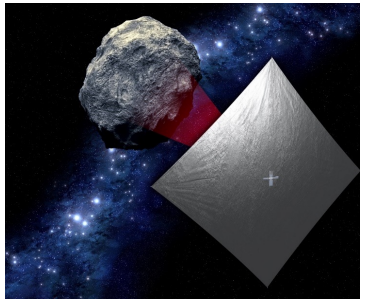
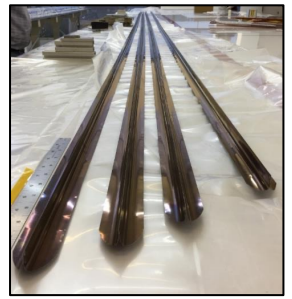


CubeSat Class Sailcraft: TRL-6$^+$ for deep space missions

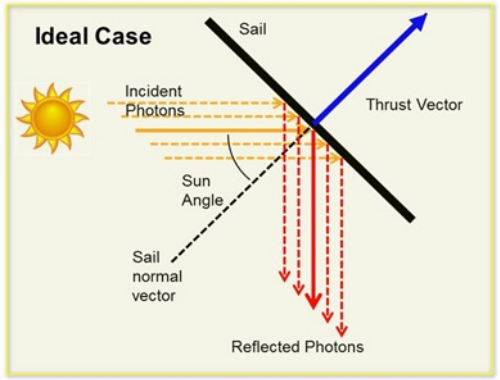
- 6U cubesat; 86 m^2 (925 ft^2) solar sail propulsion system
- Launched November 16 with Artemis 1
- Unable to make radio contact (as of this time)

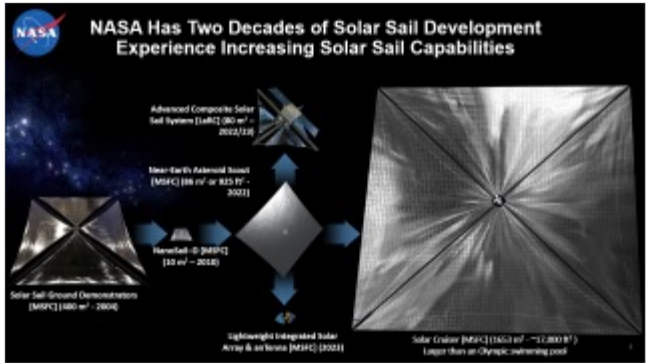


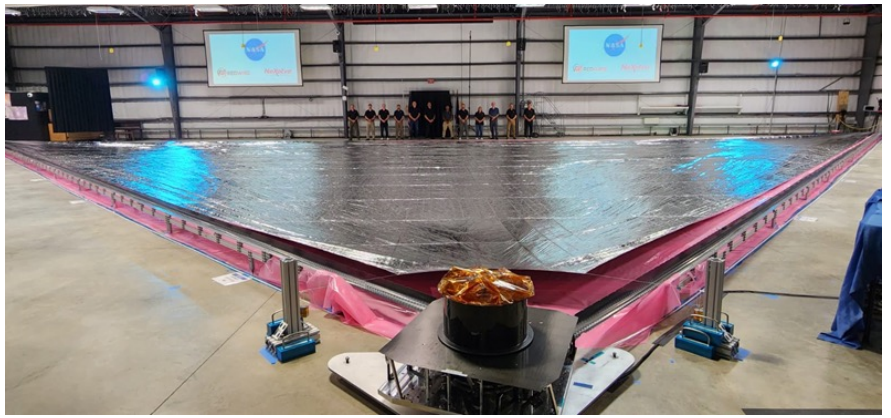
7.3 m (~24 ft) sail booms

86 m^2 solar sail deployment test

- SmallSat Class Sailcraft: TRL-5$^+$ for deep space missions
  - ~100 kg class spacecraft; sails up to ~5000 m^2 (53,800 ft^2)
  - >$10M allocated to achieve TRL-6 in FY23
  - Rideshare offered for space demo in 2028







440 m^2 solar sail deployment test
29.5 m (~100 ft) sail booms

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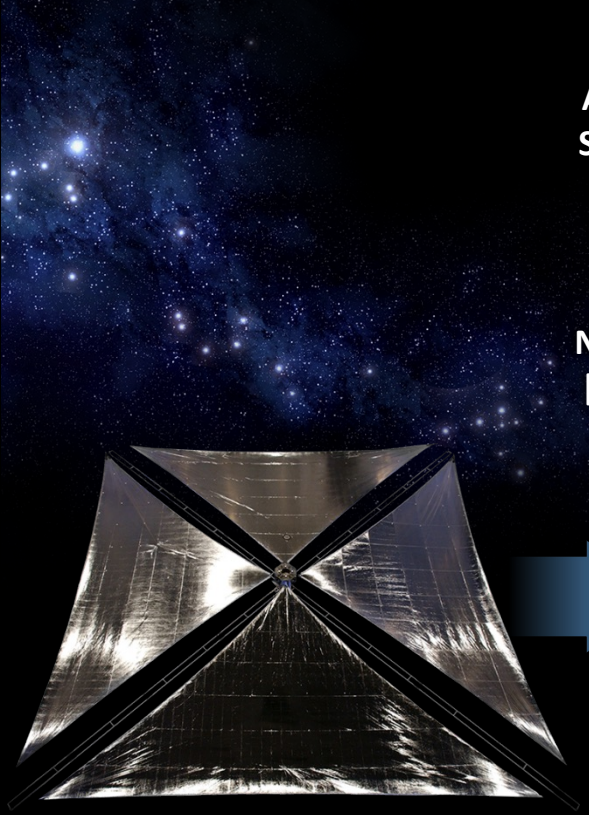
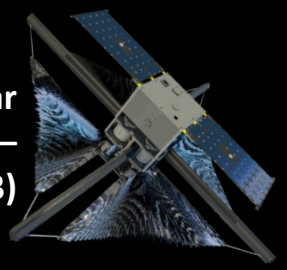
NASA Has Two Decades of Solar Sail Development Experience Increasing Solar Sail Capabilities



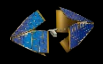
Solar Sail Ground Demonstrators [MSFC] (400 m^2 - 2004)

NanoSail–D [MSFC] (10 m^2 – 2010)

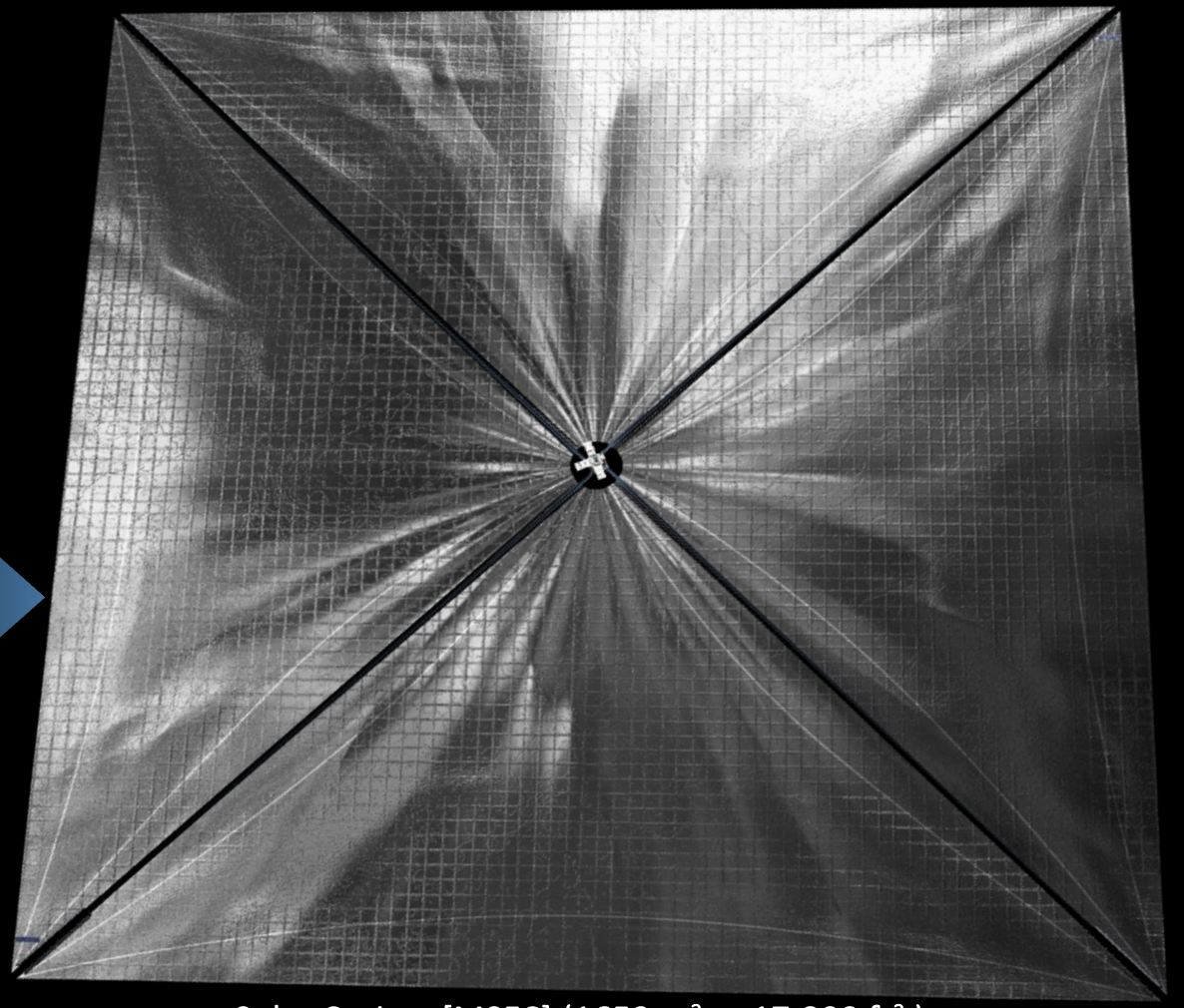


Advanced Composite Solar Sail System [LaRC] (80 m^2 – 2022/23)

Near-Earth Asteroid Scout [MSFC] (86 m^2 or 925 ft^2 - 2022)



Lightweight Integrated Solar Array & anTenna [MSFC] (2023)



Solar Cruiser [MSFC] (1653 m^2 - ~17,800 ft^2)
Larger than an Olympic swimming pool