



Jet Propulsion Laboratory
California Institute of Technology

Lunar Flashlight Mission

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Lunar Flashlight

To detect surface ice deposits in south pole lunar cold traps

Measurement Approach:

- *Lasers in 4 different bands illuminate the lunar surface permanently shadowed craters.*
- *Light reflected off the lunar surface enters the reflectometer to distinguish water ice from regolith.*

Teaming:

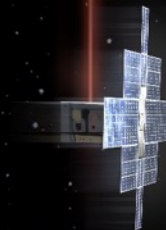
- *JPL - MSFC - GSFC*
- *S/C 6U - 14 kg: JPL*
- *Mission Design & Nav: JPL*
- *Propulsion: LMP103S (MSFC)*
- *Payload: 4-band reflectometer*
- *I&T: JPL*

Orbit:

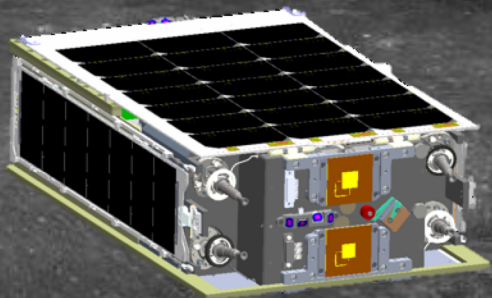
- **Elliptic:** 15-9000Km
- **Period:** 12hrs
- **Perilune:** South Pole
- **Sci Pass:** <6min

Phases/Milestones

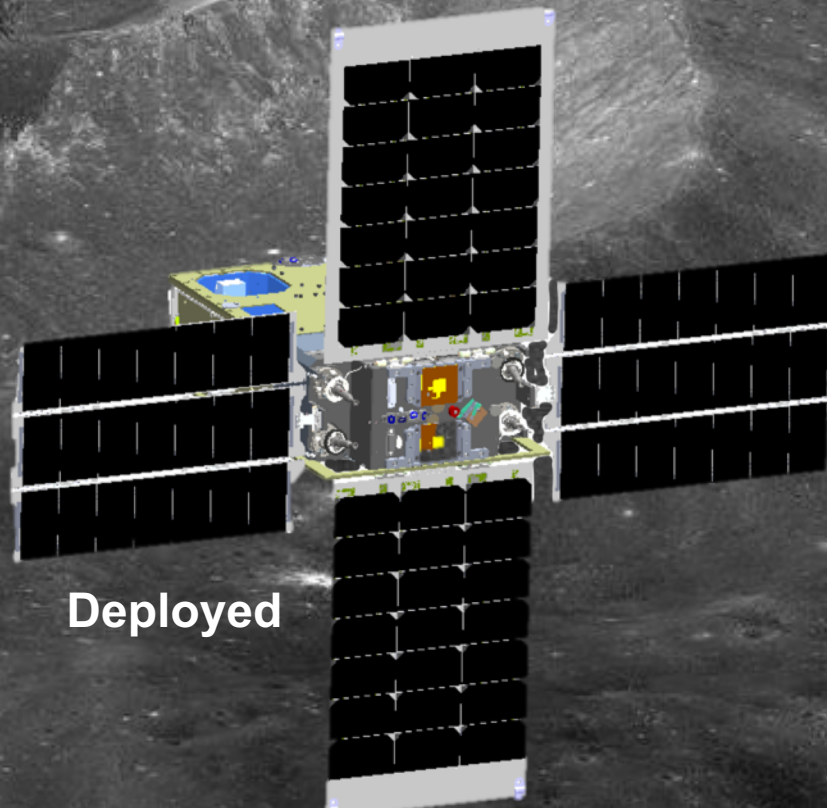
- **Launch:** SLS EM1
- **Schedule:** Launch **Dec, 2019**
- **LOI:** Launch +6 months
- **I&T Start:** July 2018
- **Delivery:** April 2019
- **Phase E:** <1 year



Configurations



Stowed



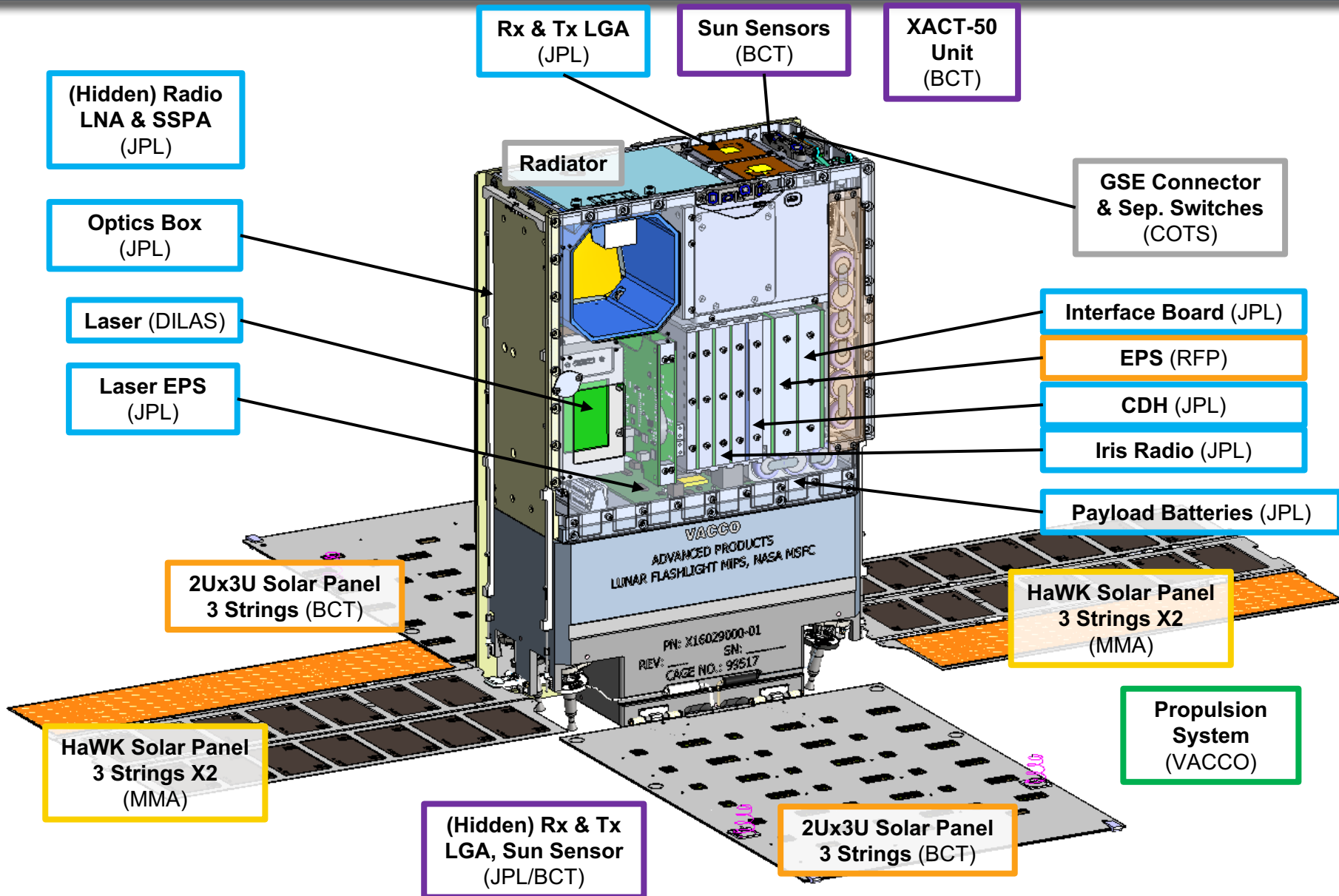
Deployed

NRHO



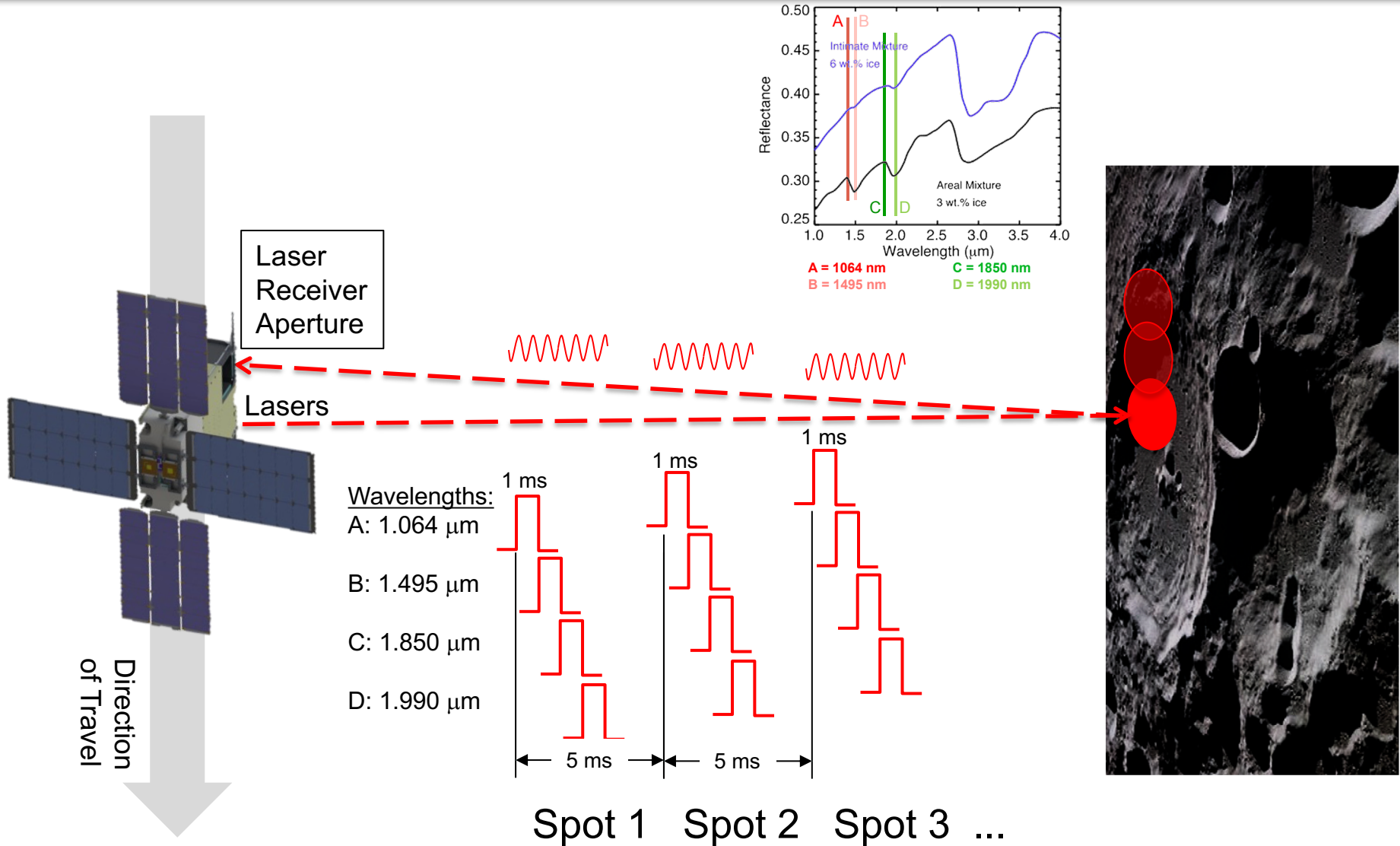


The Lunar Flashlight Spacecraft



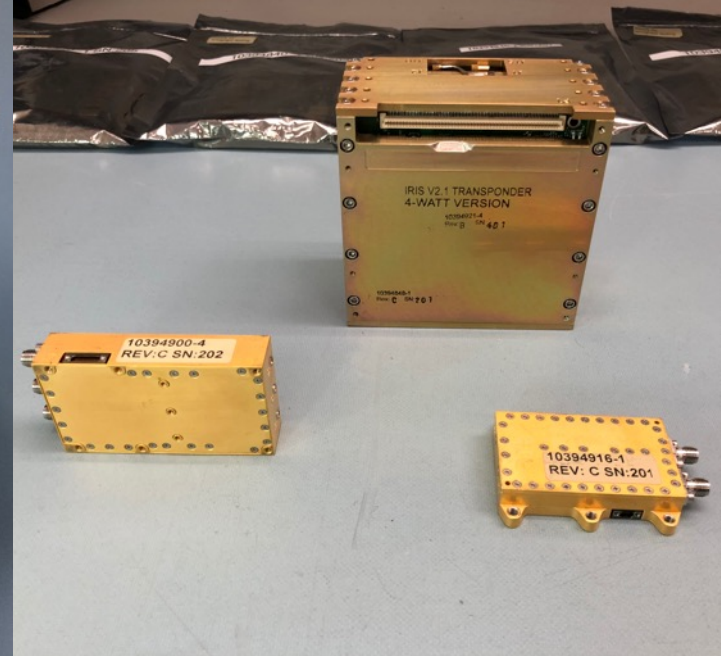
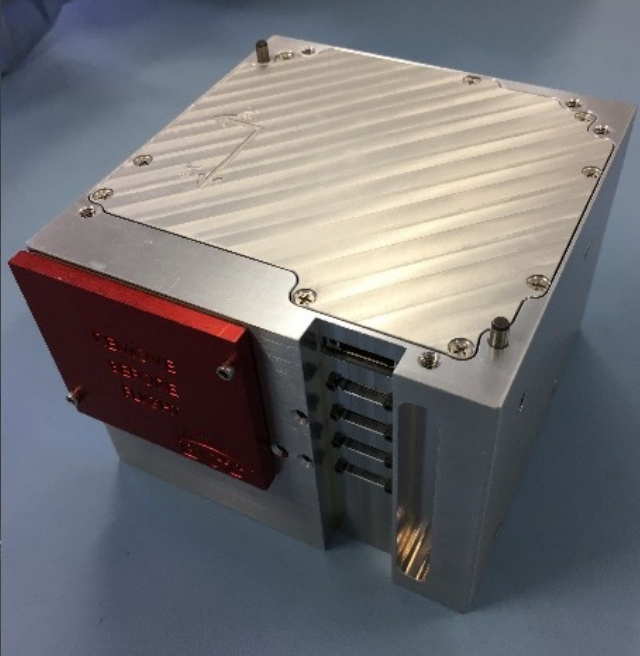
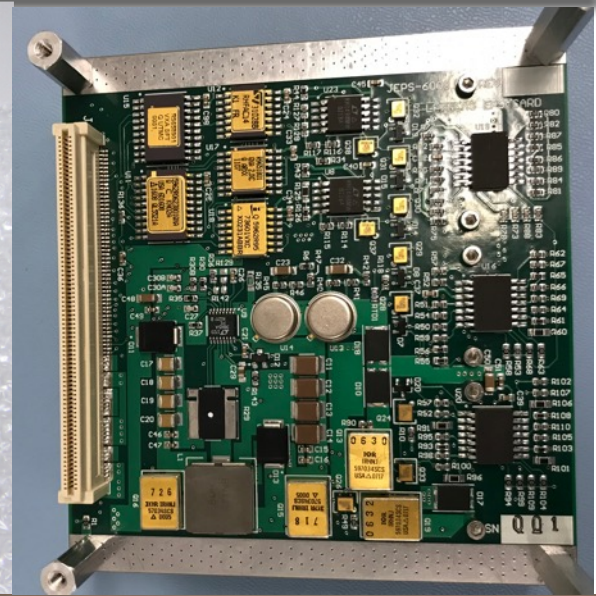
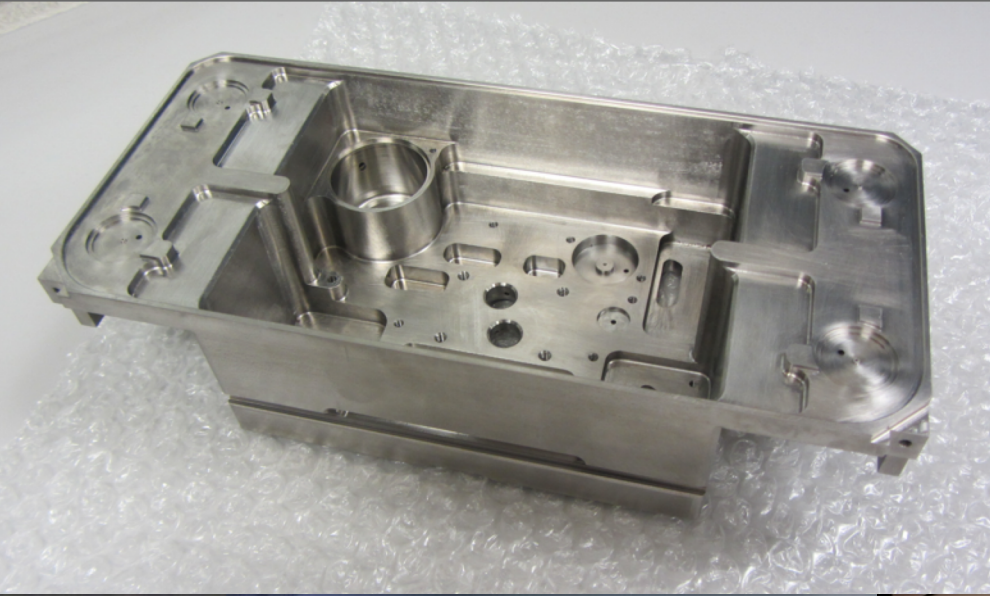
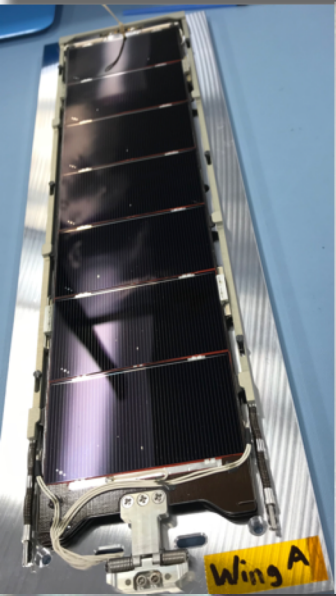


Lunar Flashlight Operational Overview





Flight Hardware





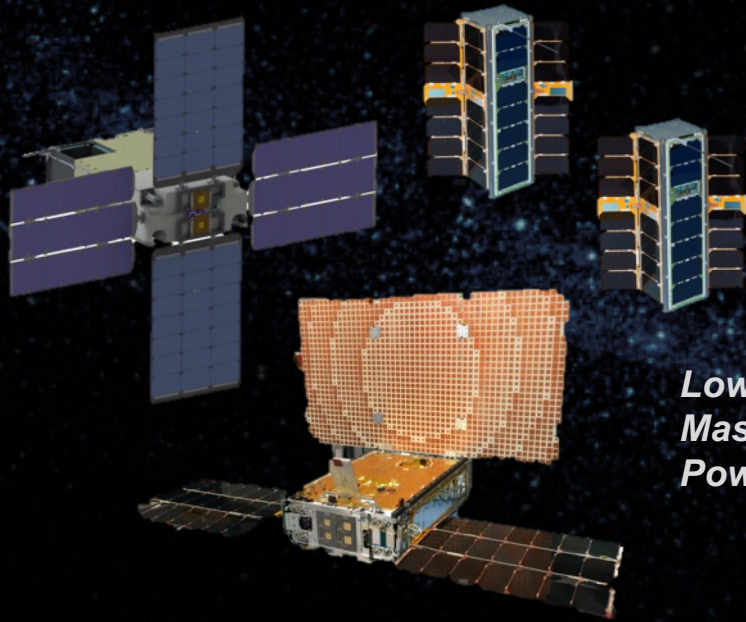
Summary

- ◆ **Lunar Flashlight will be a demonstration of the maximum capability that can be crammed into a 6U form factor**
 - Prop system provides ≈ 300 m/s, one instrument

- ◆ **Deep space rad tolerant capabilities developed for Lunar Flashlight can be applied to future missions.**
 - Iris radio, Sphinx flight computer, green propulsion, XACT-50 (50mN wheels) ADCS, compact lasers, higher efficiency solar arrays

- ◆ **Demonstrating the Near Rectilinear orbit operations will feed forward to other missions as well to use low delta-v solutions for lunar missions.**

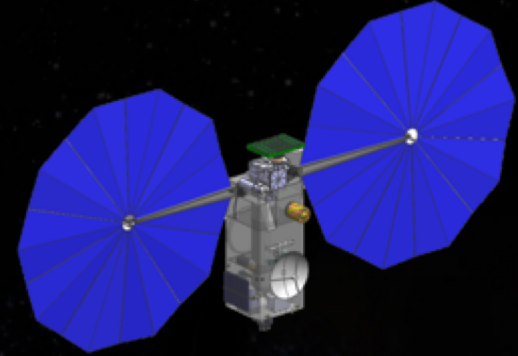
TODAY



*Lower
Mass &
Power*

*Technology Demonstrations
Instruments and spacecraft components*

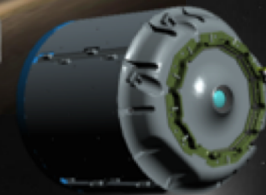
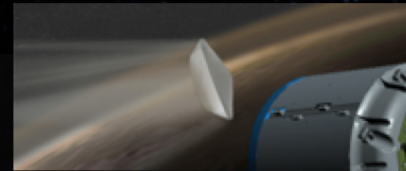
FUTURE



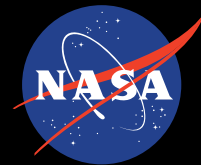
*Lower cost Small Science Missions
Inner solar system (<\$100M)*



More Affordable Outer Planet Missions



Science Probes to New Places



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