A Breakthrough Propulsion Architecture for Interstellar Precursor Missions

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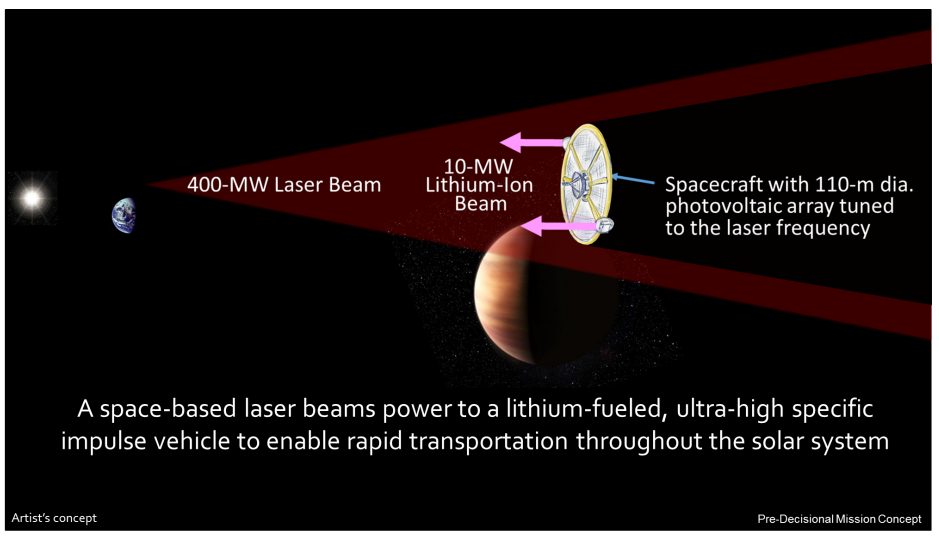
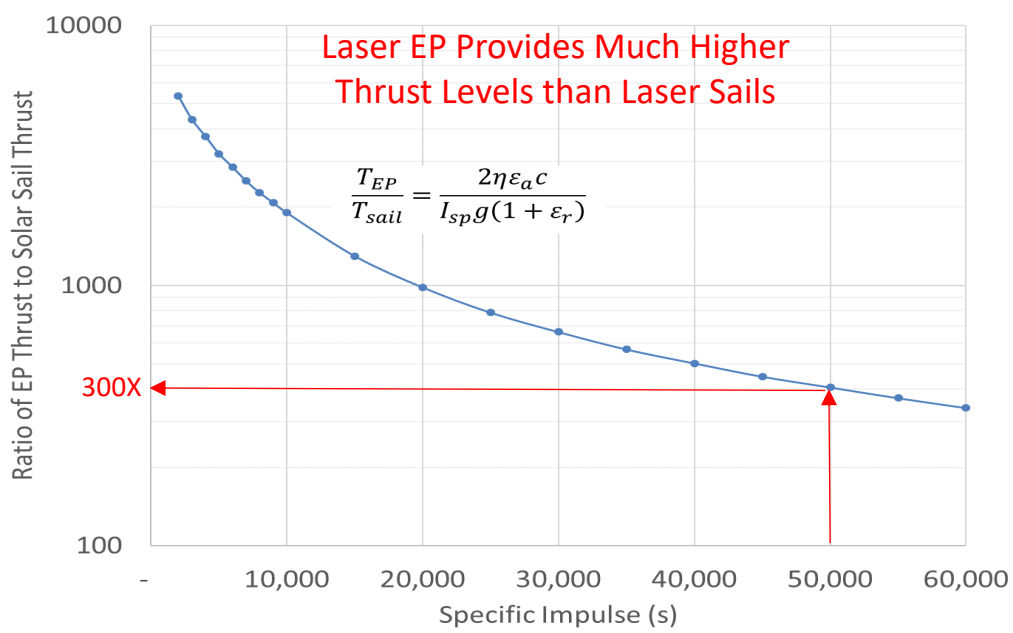
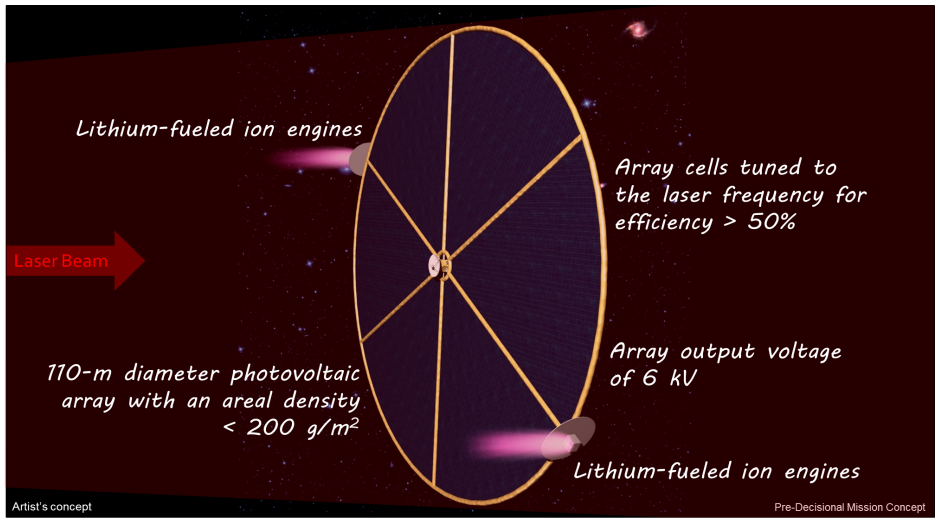
Concept: Beam power across the solar system to a direct-drive, ultra-high Isp ion propulsion system to enable missions that require characteristic velocities of > 100 km/s with conventional sized spacecraft.

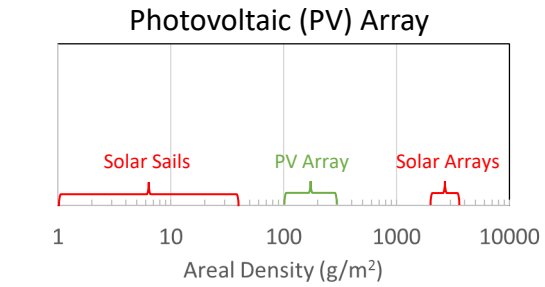


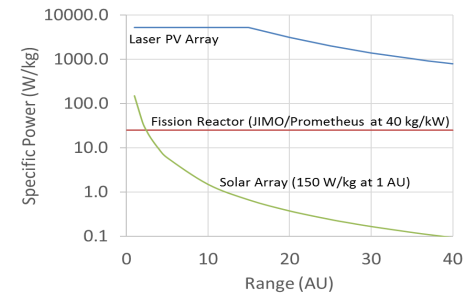


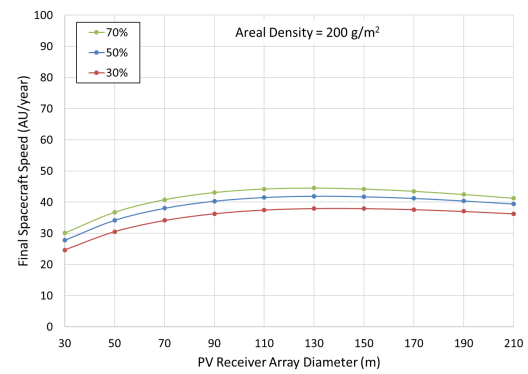
Features: Laser beam increases photon flux by 100X at all solar ranges. System reduces specific mass of the spacecraft by 1000X and increase thrust levels by > 300X relative to laser sails.

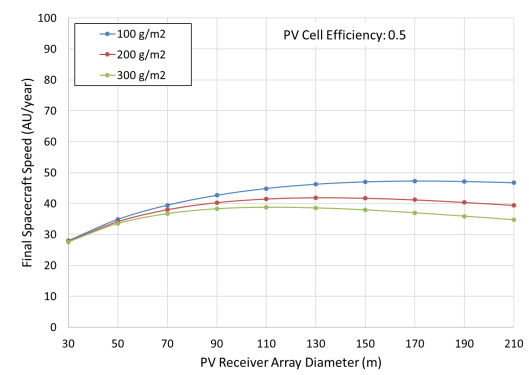
Goal is a System Capable of Achieving 40 AU/year

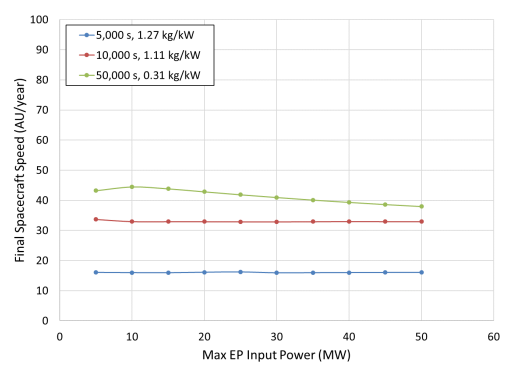


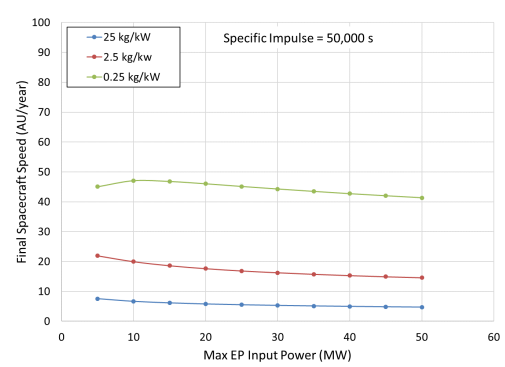












System Characteristics

Laser:
- Wavelength: 300 nm
- Aperture: 2000 m
- Output Power: 400 MW

Vehicle:
- Specific Mass:
- Dry Mass:
- Propellant Mass:

PV Array:
- Areal Density: 200 g/m²
- Cell Efficiency: 50%
- Output Voltage: 6 kV

Electric Propulsion
- Max Power: 10 MW
- Specific Impulse: 50,000 s
- Direct-Drive

Pre-Decisional Mission Concept