

SPACE EXPLORATION SYMPOSIUM (A3)
Space Exploration Overview (1)

Author: Mr. Bryan Smith
NASA Glenn Research Center, United States, bryan.k.smith@nasa.gov

HIGH-POWER SOLAR ELECTRIC PROPULSION TECHNOLOGY DEVELOPMENT AND SPACE
DEMONSTRATION**Abstract**

NASA has long identified high-power solar electric propulsion as means of improving the affordability of beyond-low Earth orbit in-space transportation. Mission demands require solar electric propulsion systems capable of operating at thrust and power levels more than twenty times greater than NASA has previously utilized in space. Since 2012 the NASA Space Technology Mission Directorate followed a coordinated plan to mature the requisite solar array and electric propulsion technology needed to implement a 30-50 kilowatt-class solar electric propulsion capability. The solar array and electric propulsion elements of that plan recently completed major technology milestones that established readiness of technology for adoption in flight systems. In conjunction with successful hardware developments, concepts were identified to flight-demonstrate the technologies. One concept selected for further development is the Asteroid Redirect Robotic Mission. If implemented, the Asteroid Redirect Vehicle will form the basis for a capability that can be cost-effectively evolved over time to provide solar electric propulsion transportation for a range of follow-on mission applications at power levels in excess of 100 kilowatts.