



NASA STTR 2008 Phase I Solicitation

T3 Technologies for Space Exploration

This topic seeks to solicit advanced innovative technologies and systems in space power and propulsion to fulfill our Nation's goal of space exploration. The anticipated technologies should advance the state-of-the-art or feature enabling technologies to allow NASA to meet future exploration goals.

Subtopics

T3.01 Technologies for Space Power and Propulsion

Lead Center: GRC

Development of innovative technologies and systems are sought that will result in high performance in space power and propulsion systems that are long-lived in the relevant mission environment and that substantially enhance/enable future missions. The technology developments being sought would significantly increase the system performance through highly-efficient generation and utilization of power and in-space propulsion.

Innovations are sought that will significantly improve the efficiency, mass specific power, operating temperature range, radiation hardness, stowed volume, design flexibility/reconfigurability, autonomy, and reduce the cost of space power systems. In power generation, advances are needed in photovoltaic cell technology (including materials, structures, and the incorporation of nanomaterials); solar array module/panel integration (including advanced coatings, monolithic interconnects, and high-voltage operational capability); and solar array designs (including ultra-lightweight deployment techniques for planar and concentrator arrays, restowable/redeployable designs, high power arrays, and planetary surface concepts). In energy storage systems, advances are needed in primary and rechargeable batteries, and regenerative fuel cells. Advances are also needed in power management and distribution systems, power system control, and integrated health management.

Innovations are sought that will improve the capability of spacecraft propulsion systems. In electric propulsion technology, radioisotope electric propulsion advances are needed for ion and Hall thruster systems, including cathodes, neutralizers, electrode-less plasma production, low-erosion materials, high-temperature permanent magnets, and power processing. Innovations are needed for xenon, krypton, and metal propellant storage and distribution systems. In small chemical propulsion technology, advances are sought for non-catalytic ignition methods for advanced monopropellants and high-temperature, reactive combustion chamber materials. Advances are also sought for chemical, electrostatic, or electromagnetic miniature and precision propulsion systems.

