



NASA STTR 2009 Phase I Solicitation

T3.01 Technologies for Space Power and Propulsion

Lead Center: GRC

Development of innovative technologies are sought that will result in durable, long-life, light-weight, high performance space power and in-space propulsion systems to substantially enhance or enable future missions.

In space power systems, innovations are sought that will offer significant improvements in efficiency, mass specific power, operating temperature range, radiation hardness, stowed volume, design flexibility/reconfigurability, autonomy, and affordability. In the area of power generation, advances are needed in photovoltaic cell technology (e.g., materials, structures, and incorporation of nanomaterials); solar array module/panel integration (e.g., advanced coatings, advanced structural materials, monolithic interconnects, and high-voltage operational capability); and solar array designs (e.g., ultra-lightweight deployment techniques for planar and concentrator arrays, restorable/redeployable designs, high power arrays, and planetary surface concepts). For energy storage technology, advances are needed in primary and rechargeable batteries, fuel cells, flywheels, regenerative fuel cell systems, and innovative design methods. Advances are also needed in power management and distribution systems, power system control, energy conversion technology (such as Stirling and Brayton systems) and integrated health management.

In space propulsion, innovations are sought that will improve electric propulsion technology. Concepts for subcomponent improvements 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 systems. Innovations are also needed for xenon and krypton fuel distribution systems. In small chemical thruster 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. Alternative fuels for space propulsion are also sought.

