



NASA SBIR 2011 Phase I Solicitation

X8.04 Advanced Photovoltaic Systems

Lead Center: GRC

Participating Center(s): JPL, JSC

Advanced photovoltaic (PV) power generation and enabling power system technologies are sought for improvements in capability and reliability of PV power generation for space exploration missions. Power levels for PV applications may reach 100s of kWe. System and component technologies are sought that can deliver efficiency, cost, reliability, mass and volume improvements under various operating conditions.

PV technologies must enable or enhance the ability to provide low-cost, low mass and higher efficiency for power systems with particular emphasis on high power arrays to support solar electric propulsion missions. Examples of PV technology areas:

- Very large solar array concepts (>300kW) operating at high voltage (>200V).
- High voltage electronics for use in solar electric propulsion vehicles operating at bus voltages >200 VDC.
- Advanced concepts for array packaging, deployment and retraction.
- Advanced PV blanket and component technology/designs.
- Array concepts and module/component technologies that emphasize cost reduction (in materials, fabrication and testing).
- Automated/modular fabrication methods.
- Component and material availability/ high volume production capability.
- Ground testability/ space qualification for large array structures.

Research should be conducted to demonstrate technical feasibility during Phase I and show a path toward a Phase II hardware demonstration, and when possible, deliver a demonstration unit for functional and environmental testing at the completion of the Phase II contract. A major focus will be on the demonstration of dual-use

technologies that address exploration mission needs but also benefit clean/ renewable energy for terrestrial applications.