NASA STTR 2012 Phase I Solicitation

T12.02 Materials and Manufacturing Technologies

Lead Center: MSFC

Participating Center(s): GRC, JSC, LaRC

NASA's science and exploration missions continue to seek materials and manufacturing techniques and capabilities that will allow missions of increased capability and reduced costs. These future missions depend highly on advancements such as lighter and stronger materials and manufacturing methods. Materials and manufacturing technologies have high value and make a significant contribution to the interests of others outside of NASA, specifically those that address broader national needs as well as the needs of the commercial space industry. The portfolio of advanced materials and manufacturing technologies is extremely broad and cross-cutting with complex interactions between core disciplines (e.g., materials and structures), applied R&D, innovation, and production.

In reference to the recent report from the National Research Council on the Space Technology Roadmaps produced by NASA's Office of Chief Technologist, the report ranks lightweight and Multifunctional Materials and Structures as an area of high priority development to be emphasized over the next 5 years. This topic seeks technologies that support these needs:

- Lightweight and multifunctional materials concepts including, advanced composite, metallic, and ceramic materials that significantly enhance future exploration and science missions and enable new missions.
- Digital/Model-based Manufacturing technologies that enable cost-effective manufacturing for reliable high-performance structures and made in low-unit production, including in-space manufacturing.
- In-space and additive manufacturing that offers the potential for game-changing weight savings and new mission opportunities.

University researchers are well-positioned to make a positive contribution within the time and funding allocation vis-a-vis a concept demonstration, enhancement of an existing component through a clever innovation, working prototype, etc. Also, this topic of materials and manufacturing technologies supports and is closely aligned with the President's National Strategic Plan for Advanced Manufacturing.