NASA SBIR 2015 Phase I Solicitation

Z6.01 Advanced Metallic Materials and Processes Innovation

Lead Center: MSFC

Participating Center(s): JPL, LaRC

This subtopic seeks innovative processes and development of metallic material systems. This subtopic has an emphasis on solid state welding practices including but not limited to: ultrasonic, thermal, and friction stir welding; new concepts for built up structure approaches for lightweight structural panel applications, advanced near-net shaping, additive manufacturing processes; advanced coating technologies for wear and environmental resistance; functionally-graded (gradient alloy) materials that exhibit superior performance exceeding that of the individual constituent alloys. Technologies should result in components with minimal or no machining. Â Â Â Â Â Â Â Â Â Â Â Â Â Â Â Â Â Â Â

Proposals are sought in the following areas:Â

- Joining new materials: technologies that enable welding on a wide range of alloys and a wide range of thicknesses, including high-strength, temperature-resistant materials (such as titanium alloys, inconels, steels, and copper), metal-matrix composites, and other materials previously considered unweldable.
- Joining of complex geometries: technologies that enable welding of complex curvature joints or other types of structure variations that increase manufacturing possibilities.
- Development and prototyping technologies for fabricating gradient alloy (functionally graded) or amorphous (bulk metallic glass) materials for solid state welding processes, near- net shape, and additive manufacturing processes.

Responses should identify key performance parameters and TRL advancement in terms of quantifiable benefits to address specific areas including but not limited to the following: reduced structural mass, increased structural efficiency, improved processing lead-time, minimized touch labor and final assembly steps, increased reliability and reduced cost. Scale-up and transition to aerospace hardware and products should also be addressed.Â Â