NASA SBIR 2007 Phase I Solicitation

S4.07 Mini-Micro Thrusters, LOX / Hydrocarbon Propulsion, and Attitude Control Systems

Lead Center: ARC

This subtopic is seeking proposals that explore uses of technologies that will provide superior performance in attitude control and overall orbit control.

Propellants play a vital role. The use of liquid oxygen / liquid hydrocarbon fuel (e.g., liquid propylene (LP) in small spacecraft for implementing attitude control and for orbital maneuvers is of interest. This subtopic is looking for candidate fuels that have superior performance to kerosene for on-orbit applications including storage stability and propulsion.

This subtopic is also seeking proposals in the following, but not limited, areas:

- Low-cost reaction wheels;
- Low-mass micro-propulsion systems;
- Propulsion systems that allow transfers from LEO or GTO to lunar orbit or other destinations;
- Propellantless means to achieve delta-V (e.g., momentum exchange, electrodynamic interaction with the Earth’s magnetosphere) as a viable Cis-Lunar transport system;
- Flexible and modular (i.e., non-customized) tankage that is scalable to accommodate multiple mission delta-V requirements without safety and design re-qualification for each mission.

Phase 1 - Research should demonstrate the technical feasibility and show a path towards a hardware/software demonstration. Plan a demonstration to validate the technologies/tools/processes. Bench or lab-level demonstrations showing concept viability is encouraged. Commercial applicability should be addressed.
Phase 2 - Emphasis should be placed on developing and demonstrating the technology under relevant test conditions. Additionally, a path should be outlined that shows how the technology could be commercialized or further developed into space-worthy systems. When applicable, researchers should deliver a demonstration unit for functional and environmental testing at the completion of the Phase 2 contract.