



NASA SBIR 2018 Phase I Solicitation

S4.03 Spacecraft Technology for Sample Return Missions

Lead Center: JPL

Participating Center(s): GRC, GSFC, JPL, MSFC

Technology Area: TA2 In-Space Propulsion Technologies

NASA plans to perform sample return missions from a variety of scientifically important targets including Mars, small bodies such as asteroids and comets, and outer planet moons. These types of targets present a variety of spacecraft technology challenges.

Some targets, such as Mars and some moons, have relatively large gravity wells and will require ascent propulsion. Includes propellants that are transported along with the mission or propellants that can be generated using local resources.

Other targets are small bodies with very complex geography and very little gravity, which present difficult navigational and maneuvering challenges.

In addition, the spacecraft will be subject to extreme environmental conditions including low temperatures (-270°C), dust, and ice particles.

Technology innovations should either enhance vehicle capabilities (e.g., increase performance, decrease risk, and improve environmental operational margins) or ease sample return mission implementation (e.g., reduce size, mass, power, cost, increase reliability, or increase autonomy).