This subtopic is targeted at the development of technologies and systems, which can enable the realization of small spacecraft science missions. While small spacecraft have the benefit of reduced launch costs by virtue of their lower mass, they may be currently limited in performance and their capacity to provide on-orbit resources to payload and instrument systems. With the incorporation of smaller bus technologies, launch costs, as well as total life cycle costs, can continue to be reduced, while still achieving and expanding NASA’s mission objectives.

The Low-Cost Small Spacecraft and Technologies category is focused on the identification and development of specific key spacecraft technologies primarily in the areas of integrated avionics, attitude determination and control including de-orbit technologies, and spacecraft power generation and management. The primary thrust of this topic is directed at reducing the footprint and resources that these bus subsystems require (size, weight, and power), allowing more of these critical resources to be shifted to payload and instrument systems, and to further reduce the overall launch mass and volume requirements for small spacecraft.

Note that related topics of interest to S4 Low-cost Small Spacecraft and Technologies may be found in other areas of the solicitation: S3.01 Command, Data Handling and Electronics; S3.03 Power Generation and Conversion; and S3.05 Power Management and Storage.

Proposals should show an understanding of one or more relevant science needs, and present a feasible plan to fully develop a technology and infuse it into a NASA program.

Research should be conducted to demonstrate technical feasibility during Phase I and show a path toward a Phase II hardware and/or software demonstration, and when possible, deliver a demonstration unit or software package for NASA testing at the completion of the Phase II contract.

Subtopics
S4.01 De-orbit Devices/Technologies for Small Spacecraft

Lead Center: ARC
Participating Center(s): GRC, KSC

NASA intends to place small spacecraft (Miniature Integrated Payload Suites

Lead Center: ARC
Participating Center(s): GSFC

In order to fully realize the economy, launch frequency, and science utility benefits that small spacecraft represent, a new generation of MEMS-based sensor suites are desired. These sensors could be the result of miniaturization and repacking of existing sensors, or consist of novel devices and technologies that can accomplish similar measurements of larger systems in a fraction of the current size, weight and power. In addition, these suites would contain the necessary data processing and power conditioning systems to support routine operation. Compatibility with Space Plug and Play (SPA) or similar architectures that streamline system integration processes is also desired.