



NASA STTR 2011 Phase I Solicitation

T4.01 Innovative Sensors, Support Subsystems and Detectors for Small Satellite Applications

Lead Center: GSFC

As the launch opportunities of very small satellites increase, NASA needs advanced capabilities to be developed in order to increase the viability of world-class scientific and technological applications within smaller constraints. This will allow NASA to use every class of orbiting system to make measurements to improve the scientific understanding of the Earth, the Sun and the cosmos.

This STTR solicitation is to help provide advanced technologies for satellites with masses less than approximately 20 kg and volumes less than approximately 10,000 cm³. Components or subsystems are sought that demonstrate a capability that is applicable to orbital missions to 800 km and mission durations up to 2 years. New approaches, instruments, and components are sought that will:

- Enable new Earth Science, Solar Science, or Astronomy measurements.
- Enhance an existing measurement capability by significantly improving the performance (spatial/temporal resolution, accuracy, range of regard).
- Substantially reduce the resources (cost, mass, volume, or power) required to attain the same measurement capability.
- Provide satellite bus capabilities that increase the capabilities of very small satellites while meeting the significant constraints imposed by the very limited size and mass of the observatory.

Small Satellite Subsystem Technologies

Components and subsystems are required to furnish satellite bus capabilities for very small satellites. The subsystems are mass and volume constrained to a reasonable portion of satellites that must have total masses and volumes less than 20 kg and 10,000 cm³. In particular, NASA needs advanced component and/or subsystems designs for power, attitude control, telemetry, structures, propulsion, data and command processing, ground communication, and crosslink communication.

Components and subsystems must be those that consider the severe mass, volume, and power constraints imposed by these very small spacecraft.

Small Satellite Sensors

Sensors are required that support the assessment the state of spacecraft, and formations of spacecraft, needed to conduct sophisticated NASA science and technology missions. Sensors are required for spacecraft attitude, position, and velocity; relative attitude position and velocity; and accelerations. In addition, component temperatures, mechanism states, and magnetic field strength and direction are also needed.

Small Satellite Science Detectors and Instruments

Instruments or detectors are required that support Earth Science, Solar Physics, and Astrophysics experiments. Components and subsystems must be those that consider the severe mass, volume, and power constraints imposed by these very small spacecraft.