Envisioned NASA science missions will increasingly use large, and/or distributed, observatories in orbits beyond
LEO. Advanced Guidance Navigation and Control (GN&C) technology is required for these platforms to address
high performance and reliability requirements while simultaneously satisfying low power, mass, volume and
affordability constraints. In particular, there are many technology gaps in challenging orbital environments, including
highly elliptical Earth orbits, libration point orbits, and lunar and planetary orbits. A vigorous effort is needed to
develop guidance, navigation and control methodologies, algorithms, and sensor-actuator technologies to enable
revolutionary science missions. Of particular interest are highly innovative GN&C technology proposals directed
towards enabling scientific investigators to exploit new vantage points, develop new sensing strategies, and
implement new system-level observational concepts that promote agility, adaptability, evolvability, scalability, and
affordability. Specific areas of research include:

_**Precision Pointing**_

Innovative GN&C solutions for scientific instrument and laser communication system pointing, tracking, and
stabilization are sought. Proposals that exploit and combine recent advances in attitude determination and control,
lasers, advanced electro-mechanical packaging are encouraged. Proposed NASA science missions provide
applications with pointing accuracies of 3 microradians or less with jitter of 30 nanoradians or less.

_**Formation Flying**_

Novel approaches to autonomous sensing and navigation of multiple distributed space platforms are sought. Of
particular interest are sensing systems for formation, relative navigation and attitude. Proposed NASA science
missions provide applications with relative range accuracies of 1 cm or less over formation scales of several km.

_**Low Impact Sensors and Actuators**_

GN&C sensors and actuators such as Sun sensors, Earth sensors, star/celestial object trackers, fine guidance
sensors, gyroscopes, accelerometers, magnetometers, reaction/momentum wheels, control-moment gyros,
magnetic torquers, tethers, attitude control thrusters, etc are sought. Of particular interest are technologies that will
provide a sensing or actuation function, having performance (e.g., dynamic range, stability, accuracy, noise,
sensitivity, bandwidth, control authority, etc.) consistent with the state-of-the-art, but with significantly reduced
impact (mass, power, volume, and cost) to the host spacecraft. These resource reduction improvement factors
should be quantified in the proposal and show a minimum factor of 2 with a goal of 10 or greater.