

Filling Technological Gaps for Planetary Science Missions with Customized SRI Solutions

SRI International seeks participation in the technology showcase to present their suite of applicable expertise to the NASA Planetary Science missions. SRI supports research and development for a broad range of technical areas across government and industry that would be useful to upcoming NASA Planetary Science missions. For example, SRI is a world leader in radar instrumentation and data processing, supporting R&D for the full spectrum of related products, including sensor technologies, processing algorithms, and analytical tools.

One example of this is our world-leading ground- and foliage-penetrating radar technologies, which are used to map terrain around the globe to find unexploded ordnance and other hidden items of interest. In addition, SRI designed, built, and operates the Advanced Modular Incoherent Scatter Radar (AMISR) for the National Science Foundation to study complex upper atmosphere and space weather events. AMISR is the first system to provide scientists with the technology necessary to collect critical data and study global climate trends from year to year. Scientists can now investigate the energy and momentum transfer among all layers of the Earth's upper atmosphere, accessing critical data on the complex physical processes related to the Sun, magnetosphere, and ionosphere. Remote operation and electronic beam steering allow researchers to operate and position the radar beam instantaneously to accurately measure rapidly changing space weather events. This domain knowledge would be directly applicable to several abstracts for this showcase.

SRI also employs a broad range of experts in spacecraft instrumentation design and data analysis, with scientists and engineers who have contributed to missions including Parker Solar Probe (PSP), the Gravity Recovery and Interior Laboratory (GRAIL), the Cyclone Global Navigation Satellite System (CYGNSS), the Sun Radio Interferometer Space Experiment (SunRISE), the Radio Aurora Explorer (RAX) CubeSat, the SRI CubeSat Imaging Radar for Earth Science (SRI-CIRES) that utilizes Interferometric Synthetic Aperture Radar (InSAR) in a small form factor, and mission concepts like the Farside Array for Radio Science Investigations of the Dark Ages and Exoplanets (FARSIDE). SRI also has proven capabilities in robotic mobility, optics design and fabrication, and novel diamagnetically levitated optical beam steering technology for highly stable, space rated lasers that can point with micro-radians of precision. This expertise would be extremely valuable for planetary missions going forward.

SRI International, an independent, nonprofit research institute with a rich history of supporting government and industry, has led for 75 years in the discovery and design of ground-breaking products, technologies, and industries, collaborating across technical and scientific domains. SRI (formerly Stanford Research Institute) is organized around broad disciplines and capabilities, from research and development divisions and labs to groups that excel at identifying new opportunities, developing products, and creating custom solutions. An SRI research engineer at the SRI technologist booth at this showcase will present these capabilities and answer questions from interested parties. While no hardware will be present, we will distribute illustrative infographics and copies of relevant papers to promote SRI's ability to partner on many of the future mission concepts at the showcase.