# NASA's Solar System Exploration Research Virtual Institute: Science and technology for lunar exploration

**Author Greg Schmidt**
NASA Solar System Exploration Research Virtual Institute (gregory.k.schmidt@nasa.gov)

**Co-Authors: Brad Bailey** (NASA SSERVI); **Kristina Gibbs** (NASA SSERVI)

The NASA Solar System Exploration Research Virtual Institute (SSERVI) is a virtual institute focused on research at the intersection of science and exploration, training the next generation of lunar scientists, and development and support of the international community. As part of its mission, SSERVI acts as a hub for opportunities that engage the larger scientific and exploration communities in order to form new interdisciplinary, research-focused collaborations. The nine domestic SSERVI teams that comprise the U.S. complement of the Institute engage with the international science and exploration communities through workshops, conferences, online seminars and classes, student exchange programs and internships.

SSERVI represents a close collaboration between science, technology and exploration enabling a deeper, integrated understanding of the Moon and other airless bodies as human exploration moves beyond low Earth orbit. SSERVI centers on the scientific aspects of exploration as they pertain to the Moon, Near Earth Asteroids (NEAs) and the moons of Mars, with additional aspects of related technology development, including a major focus on human exploration-enabling efforts such as resolving Strategic Knowledge Gaps (SKGs). The Institute focuses on interdisciplinary, exploration-related science focused on airless bodies targeted as potential human destinations. Areas of study represent the broad spectrum of lunar, NEA, and Martian moon sciences encompassing investigations of the surface, interior, exosphere, and near-space environments as well as science uniquely enabled from these bodies. This research profile integrates investigations of plasma physics, geology/geochemistry, technology integration, solar system origins/evolution, regolith geotechnical properties, analogues, volatiles, ISRU and exploration potential of the target bodies.

New opportunities for both domestic and international partnerships are continually generated through these research and community development efforts, and SSERVI can further serve as a model for joint international scientific efforts through its creation of bridges across disciplines and between countries. Since the inception of the NASA Lunar Science Institute (SSERVI's predecessor), it has and will continue to contribute in many ways toward the advancement of lunar science and the eventual human exploration of the Moon.

**Keywords:** human exploration, virtual institute, telescience, strategic knowledge gaps