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LOCAL SCIENTISTS TO WORK ON INTERNATIONAL LUNAR ORBITER MISSION

NASA Sponsored Participating Scientist on Korea Pathfinder Lunar Orbiter

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NASA recently announced the selection of 9 Participating Scientists to work with the Korea Aerospace Research Institute (KARI) of the Republic of Korea on their Korea Pathfinder Lunar Orbiter (KPLO) mission. Two of the nine are scientists from Boulder's Space Science Institute (SSI). The KPLO mission will be South Korea's first foray into robotic planetary exploration. The orbiter, scheduled to be launched in 2022, will carry a complement of five scientific instruments, including the NASA-supplied ShadowCam for collecting high spatial resolution images of permanently shadowed regions at the lunar polar regions which have been found to contain ice.

The SSI scientists selected are Dr. William Farrand of Westminster, Colorado and Dr. Gorden Videen of Silver Spring, Maryland. Dr. Farrand's proposed investigation will use data from the orbiter's innovative Polarimetric Camera (PolCam) to investigate lunar pyroclastic deposits. Lunar pyroclastic deposits are distinctive volcanic terrains formed by ancient ash-generating volcanic eruptions. They are compositionally unique and have been suggested to be a potentially valuable resource for utilization by future human explorers. Dr. Farrand will characterize the way that they interact with linearly polarized light (light waves vibrating in a uniform plane). Telescopic studies of the Moon have suggested that these deposits have a characteristic signature in the way that they respond to polarized light and Dr. Farrand's investigation will study this effect in known areas and use this property to potentially discover previously unrecognized pyroclastic deposits.

Dr. Videen's proposed investigation also will be using the polarized light captured by the PolCam instrument to characterize the size and optical properties of the lunar regolith, the dust and fragmented rock that blanket the surface. One issue with interpreting such light-scattering signals is that lunar regolith particles are charged by the solar wind and radiation, creating a fluffy, fairy-castle structure that does not occur naturally on Earth. Dr. Videen will use

additive-manufacturing technology to print 3D surfaces having different porosities and compositions, similar to what is expected on the Moon. The light scattering from these surfaces will be coupled with computer model calculations to interpret the PolCam data.

After a long post-Apollo hiatus, lunar exploration is enjoying a renaissance, with recent missions launched by China, India and Israel, and a planned return of human explorers to the Moon by the United States in the form of the Artemis program. The KPLO mission will provide valuable information to better understand Earth's satellite and pave the way for human exploration. The KPLO will be the first lunar mission to incorporate a polarimeter for remote sensing.

About SPACE SCIENCE INSTITUTE

Space Science Institute (SSI) is a nonprofit, public benefit research and education 501(c)(3) corporation founded in 1992 with a vision to expand humankind's understanding and appreciation of planet Earth, our Solar System, and the universe beyond. SSI's mission is to (a) enable scientists to make new discoveries, (b) increase science and technology literacy for people of all ages and backgrounds, and (c) inspire youth to pursue science-technology education and career opportunities. It is headquartered in Boulder, Colorado, with locations distributed across the U.S. and internationally.

www.space-science.org

SSI scientists work on many prestigious space missions, including but not limited to the Mars Exploration Rovers, Rosetta, Mars and Lunar Reconnaissance Orbiters, Mars Science Lander, Juno, ExoMars, OSIRIS-REx, and Mars 2020. Areas of research also include heliophysics, observational astronomy (with such facilities as Hubble Space Telescope, SOFIA), and exoplanets (Kepler). SSI's National Center for Interactive Learning (NCIL) fosters collaboration between scientists and educators to create nationally touring exhibits for museums and libraries, provide professional development and webinar training for science educators, and build popular digital games and apps with over a million hits.

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