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Interactive Presentations - 27th IAA SYMPOSIUM ON HUMAN EXPLORATION OF THE SOLAR
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ROVER AS A COMPANION IN A SIMULATED MOON BASE ENVIRONMENT: VARIOUS USES
AND ADVANTAGES.

Abstract

As robotics has advanced, robots have steadily seen an increased use in space exploration. Famously the Martian Rovers (Spirit, opportunity, curiosity, perseverance, Tian Wen), but the less well known cousin, the lunar rover has been out of the spotlight, with the exception of the latest Chang'e 3 and 4 Yutu Rovers, and the upcoming 'Viper' rover from Nasa Launching later this year. However, with the "Moon base race" now under way, the lunar rover may see a resurgence and the first Moon bases are erected.

We hope to study some of the various function a rover could perform as a companion with human astronauts living on the moon. Function such as sample gathering, a navigation companion, and a mapping tool. With lunar bases they may have the additional function of remote repair.

For the purposes of this study the first three functions will be the focus. A Picar pro will be the main rover used for this mission for its modularity and accessibility. However the Sora-q will also be tested in a limited capacity. The Picar pro will gather samples for analysis in a Lunar analogue environment. In this case Mt. Etna and Vulcano Island. Various 3d printed wheel shapes and designs will also be tested in the regolith analogue. A software program whereby the Rover tracks its position in relation to the Moon base will be implemented. Finally an experiment to guide an analogue astronaut from EuroMoonMars who has reduced visibility from point A to point B will be conducted to demonstrate the Rovers capacity to guide an astronaut should a communications failure occur.