

Google Lunar XPRIZE TEAM HAKUTO's Lunar Mission.

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This paper presents Team Hakuto's lunar mission which will take a 'wheels-on-the-ground' lunar prospecting approach provided by a 4 kg rover. The rover is developed by the Japanese Team Hakuto for the Google Lunar XPRIZE competition.

In order to develop a comprehensive view of lunar resources, this paper will summarize the volatiles and other resources necessary to expand human presence into space. Team Hakuto's miniaturized rover technology and systems architecture will be provided, introducing the various subsystems and potential scientific payloads that will assist us in our first prospecting mission, which takes place in the Lactus Mortis region in 2017.

During this first mission, Team Hakuto's rover is projected to survive one lunar day. In that time, that rover will travel at least 500m and downlink high-definition video to Earth to achieve the required objectives of the Google Lunar XPRIZE. In order to further test and demonstrate technologies, the rover will attempt a total traverse distance of up to 10 km. The traverse will be executed in a flower petal pattern, repeatedly circling back toward the host lander to be photographed. The rover must maintain a line of sight to the lander; therefore deep gullies and steep slopes will be avoided in the execution of this traverse.

Team Hakuto intends to lead the first-ever private mission to another planetary body. The mission will provide a low cost opportunity to obtain ground truth data for the numerous remote sensing missions that have revealed promising regions for potential resource deposits. Mapping the volatiles and other resources on the lunar surface will also aid in the development of economic models for extracting and eventually utilizing those resources to further assist humans in the quest to extend life into outer space.