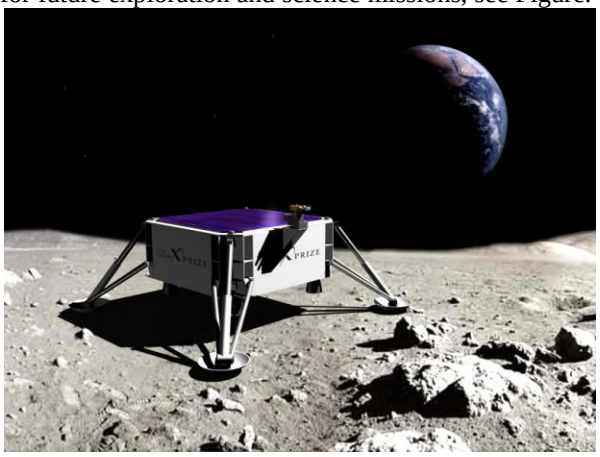
**TAKING THE NEXT GIANT LEAP.** B. Cohanim[1], M. Joyce[2], T. Mosher[3], S. Tuohy[1], and P. Cunio[4]. [1]The Charles Stark Draper Laboratory (555 Technology Square, Cambridge MA 02139), [2]Next Giant Leap, [3]Sierra Nevada Corporation, [4]Massachussetts Institue of Technology

**Abstract:** As part of the Google Lunar X-Prize, the Next Giant Leap team is developing a lander/hopper architecture that will not only compete in the prize, but will also demonstrate a new method of surface mobility for future planetary science missions. Current government funded efforts to explore space are costly, one of a kind missions. The Next Giant Leap team is not only creating an affordable architecture to win the Google Lunar X-Prize, but also developing a platform for future exploration and science missions, see Figure.



This paper will describe the Next Giant Leap team's architecture, the challenges associated with developing this architecture, the options for mitigating them, and the solutions the Next Giant Leap team has chosen. There are significant challenges, both in the development and operation for such a venture, especially by a privately funded company as part of the Google Lunar X-Prize. Mass and performance are key. Mass is a significant driver of launch vehicle cost. New technologies can not only reduce the mass of the system, but also enable this type of small lander/hopper mission to achieve the goals for exploration, science, and future endeavors on the moon and other planetary bodies.

It is also important to develop a testbed to prove our concepts before launch. As part of the development and promotion of the next giant leap team, a lunar robotic hopper testbed is being developed to mature operations, algorithms, and experience. Named the Terrestial Autonomous Lunar Reduced gravIty System (TALARIS), the testbed is designed to mimic the lunar environment by providing a 1/6th gravity mode. This paper will describe the current status of this testbed, future work, and opportunities for others to use this testbed and development of other technologies for lunar science and exploration.eplace these instructions with the text of your abstract.