

**Abstract for 11th Low Cost Planetary Missions Conference
June 9-11, 2015, Berlin, Germany**

LOW-COST PLANETARY SCIENCE WITH BALLOON BORNE OBSERVATORIES: ACHIEVING SPACE QUALITY SCIENCE AT A DOWN-TO-EARTH PRICES

Kremic, Tibor, National Aeronautics and Space Administration, John H Glenn Research Center; Steve Arnold, Johns Hopkins Applied Physics Laboratory; Tentative (Terry Hurford, National Aeronautics and Space Administration, Goddard Space Flight Center)

The National Aeronautics and Space Administration (NASA), along with the rest of government and the nation have become increasing cost conscience in recent years. This has resulted in renewed efforts at finding ways to do more with less. Planetary science is no exception. The 2013 Decadal Survey for Planetary Science made great efforts to understand the costs of proposed missions. The community has been asked to develop more affordable versions of mission concepts, especially in the flagship category. Many in the community continue to encourage NASA to prioritize lower cost missions at a more frequent cadence over fewer but larger missions.

This presentation discusses a new tool in the planetary science arsenal to achieve a broad set of planetary science questions at costs that are lower, and in some cases dramatically lower, than other options in the past. Technology advances in pointing systems and the growing capabilities of stratospheric balloons, such as the ultra-long duration flights, have caught the attention of many in the planetary science community. A workshop was held in January 2012 to help planetary scientists and NASA better understand the capabilities of balloon borne platforms, along with their strengths and limitations. Perhaps most importantly, the workshop focused on the potential science that could be achieved. The science and engineering participants discussed what, if any, science can be achieved and why or how balloon platforms would offer an advantage. Since that first workshop, not only have further discussions and studies occurred within the community, but demonstration missions have been flown with compelling results. These balloon missions have shown that the science envisioned can indeed be achievable, that balloon platforms do offer some unique advantages; and that repeated flights can be implemented at relatively low cost.

The presentation briefly summarizes the potential science and the characteristics of a balloon based observatory that make it desirable for some science investigations. The recent missions are described along with some of their challenges and achievements. Finally, a brief summary of options moving forward are considered.