EPSC Abstracts,
Vol. 2, EPSC2007-A-00290, 2007
European Planetary Science Congress 2007

NASA's New Millennium ST-9 TRGS Mission

J. F. Stocky(1), C. M. Stevens(1), R . M. Nelson,(1), Calina Seybold (1)
(1)Jet Propulsion Laboratory4800 Oak Grove DrivePasadena CA 91109, USA

NASA's New Millennium Space Technology 9 (ST-9) Terrain-Relative Guidance System (TRGS) mission is the latest of a series of in-space technology validation activities that began in 1996 with Deep Space 1.

TRGS will develop and validate new technology for:

1. Precision-guided landing and, and
2. Hazard detection (HD) and avoidance.

Precision guidance is essential to reach landing sites of great scientific interest in rugged terrain and is also necessary for co-locating assets on the surface of other bodies. Hazard detection and avoidance enables landing at sites that will not pose a threat to mission success. The critical new technology enabling precision guidance and hazard avoidance is the use of machine vision methods for image acquisition and processing. It includes means for integrating the processed data with other onboard sensors to perform terrain relative navigation (TRN). The navigation data are input to a guidance subsystem that employs an appropriate flight control subsystem to implement precision guidance and hazard avoidance. The TRN/HD does not depend significantly on the target body and mission. This will benefit several high priority missions defined by the science community including those to the Moon, Mars, Europa, Titan, and Enceladus.

ST-9TRGS is an integrated system validation project and part of New Millennium Program effort to identify the technological capabilities needed for future space science missions and the technology advances that require validation in deep space to

help provide those capabilities. NASA selected TRGS from five candidate technology capabilities that had been under preliminary consideration.

This work done at JPL under contract with NASA