

SPACE EXPLORATION SYMPOSIUM (A3)
Small Bodies Missions and Technologies (4)

Author: Mr. Menachem (Manny) Nimelman
MDA, Canada

Dr. Cameron Dickinson
MDA, Canada

Mr. Jeffrey Tripp
Canada

Mr. Frank Teti
MDA Corporation, Canada

Dr. Michael Daly
York University, Canada

Dr. Amy Shaw
MDA, Canada

Mr. Daniel Gaudreau
Canadian Space Agency, Canada

THE OSIRIS-REX LASER ALTIMETER (OLA)

Abstract

The NASA Origins Spectral Interpretation Resource Identification Security-Regolith Explorer (OSIRIS-REx) mission, scheduled for launch in September 2016, will bring a sample back to Earth from near-earth carbonaceous asteroid Bennu (1999RQ36). The spacecraft will reach Bennu in 2018 and return a sample to Earth in 2023. The OSIRIS-REx Laser Altimeter (OLA) is the Canadian Space Agency contribution to the OSIRIS-Rex Mission. The OLA system is a scanning time-of-flight lidar consisting of dual Nd:YAG lasers coupled to a 2-axis scanning mirror, complete with an integrated control and processing platform. The OLA instrument will support the medium and short range phases of the OSIRIS-REx mission. Using the high energy laser, OLA will provide both initial high accuracy range data of Bennu for the purposes of navigation, and later complete scans of the asteroid surface. The low energy laser stage will be employed at shorter ranges, where OLA data will be used to generate high density Bennu maps of the surface, specifically slopes and elevations. This data is used for selection of candidate Touch-And-Go (TAG) sites; planning the final TAG maneuver; and providing context for samples collected at the TAG sample location on Bennu. OLA's unique capabilities allow it to support both OSIRIS-REx mission planners (GNC ranging, 3D gravity model, relative pose, slope and elevation maps) as well as science team objectives (3D modeling, volume estimates, and IR return intensity maps).