Key Technology of Space Exploration (8)
Key Technology of Space Exploration (2)

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

Dr. Cameron Dickinson
MDA, Canada

MDA SPACE LIDARS

Abstract

MDA has been playing a lead role in space robotics for more than 35 years, supporting NASA's space shuttle operations and the International Space Station (ISS) build, maintenance and visiting vehicle berthing. Development of space robotic products and associated sub-systems resulted in gaining the expertise to adapt airborne and terrestrial technologies for operation in space. This unique expertise appealed to space mission developers who required reliable space solutions for their missions. Responding to a US agency request at the end of 2002, to participate in the demonstration of proximity operation technologies in LEO under all lighting conditions, MDA teamed with Teledyne Optech Inc. to convert a terrestrial laser scanner to our first space qualified scanning lidar. Around the same time period, the Phoenix Mars program was seeking a different type of lidar to help characterize the Mars atmosphere. MDA and Teledyne Optech Inc. accepted the new challenge and delivered two unique lidar solutions in 2004 and 2006 on time. Both lidars operated successfully in LEO and on the surface of Mars and opened the door to the next opportunity – supporting the OSIRIS-REx exploration mission in its pursuit of the Bennu asteroid. The OSIRIS-REx Altimeter (OLA) was launched on 2016 and is on its way to meet its asteroid target. With a heritage of three lidars supporting LEO rendezvous mission, Mars atmospheric characterization mission and an asteroid exploration mission, MDA's next generation lidar will be tailored to meet new mission requirements with a goal of providing improved performance on ranging, 3D mapping, and surface characterization. MDA is looking forward to support future exploration missions targeting distant asteroids and comets. With a demonstrated ability to deliver reliable solutions adapted to mission requirements, MDA is ready for the next challenge.