

2015 ILRS Technical Workshop

2.10 INRRI-EDM/2016: the First Laser Retroreflector Payload on Mars

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An intense activity of design, manufacturing and testing, carried out at LNF site in about two months this summer by the SCF_Lab team, has made possible the construction, qualification and integration of INRRI-EDM/2016 on the EXOMARS EDM ESA mission, supposed to fly toward the Red Planet in early 2016. INRRI (INstrument for landing-Roving laser Retroreflector Investigation) for the EDM (Entry descent and landing Demonstration Module) 2016 is a compact, lightweight, passive, maintenance-free array of Cube Corner laser Retro-reflectors to be deployed on the top panel of the EDM Central Bay. It will enable the EDM to be laser-located from Mars orbiters, through Laser altimetry, Lidar atmospheric observations from orbit, Laser ranging, Laser flashes emitted by orbiters, and lasercomm. Either one, or up to all of the above means of observation will be supported by INRRI when there is an active orbiter, especially after EDM end of life and for a long time. INRRI goals, as an enabling technology, will cover science, exploration and technology like Mars Geodesy/Geophysics, future Mars test of General Relativity, quantum physics and quantum encryption lasercomm at Mars. In addition INRRI will enable and support Mars exploration as georeferencing the EDM landing site, support precision Lidar-based landing next to the EDM, support test & diagnostics of lasercomm for Mars orbit to Mars surface data exchange, be a Mars precursor for the next evolution of laser reflectors.