Prof. Luciano Iess

Dipartimento di Ingegneria meccanica e aerospaziale
Sapienza Università di Roma,

Wednesday 12th February - at 14:00
Polo Ferrari 1 – Room n. A208

Measuring gravity in the solar system

Abstract:
Gravity determines the motion of planetary bodies, their interior structure, their shape and, ultimately, their landscape. In turn, gravity measurements provide crucial information on the interior structure and evolution of those bodies. Tracking the motion of planets and the propagation of photons as they pass near the sun constitutes the experimental foundation the old and new laws of gravity.

Thanks to the advanced radio-metric systems, we can now measure spacecraft velocities to 10^-6 m/s and accelerations to 10^-9 m/s^2 over time scales as short as 1000 s, everywhere in the solar system. These capabilities have been used by the Juno and Cassini missions to determine the interior structure of Jupiter and Saturn, and to reveal internal oceans on Titan and Enceladus. Cm-level ranging has been recently demonstrated by the ESA spacecraft BepiColombo en route to Mercury, paving the way to improved tests of general relativity. The seminar will review the methods and some recent achievements of gravity measurements in the solar system.

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