The Italian Scientific contribution to the BepiColombo Mission

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The Golden age of the Solar System Exploration; Rome, Sept 2012

E. Flamini

Schiaparelli's Mercury

Mercury Today

Mariner 10 departure mosaic after first flyby –– 1974

Messenger 2013

1974

Mosley

Messenger - 2013
Bepi Colombo demonstrated the dynamical stability of the planetary orbit in a resonance 3:2.

He was also the man, after G. A. Crocco, behind the idea of multiple fly-bys, taking advantage of the 2:1 resonance between the orbital period of the probe and Mercury.
BepiColombo Payload
ISA
Italian Spring Accelerometer

Scope: Measure of non-gravitational accelerations of the spacecraft
For fundamental Physics Study
-Tri-axial ultra sensitive accelerometers package with very high thermal stability - high performance thermal control - mK operating range;
MORE
Mercury Orbiter Radio Science Experiment

Core and mantle structure, Mercury orbit, fundamental science, gravity field.
**SERENA**
Search for Exospheric Refilling and Emitted Natural Abundances

**SERENA:** Study of composition, distribution, source and sink processes of the neutral and charged particle environment.

*Serena is composed by 4 Units*

**ELENA** investigates the Hermean escaping neutral gas (strongly linked to its surface), and the processes responsible of such a population;

**STROFIO** investigates the exospheric gas composition.

**PICAM** investigates the extension, composition, and velocity distribution of the exo-ionosphere, and the photo-ionization rate of neutrals.

**MIPA** investigates the plasma precipitation toward the surface and ions energized and transported throughout the environment of Mercury;
SIMBIO-SYS
Spectrometers and Imagers for MPO
BepiColombo Integrated Observatory

Optical high resolution and stereo imaging, Near-IR (<2.0 \mu m) imaging spectroscopy for global mineralogical mapping.

- Complex architecture, incorporating three different channels.
- High Spatial resolution >5m, real Stereo imaging, IR spectroscopy
- High performances (spatial resolution, sensitivity, bandwidth, spectral bands) within mass and volume reduced;
- State of the art detectors

In cooperation with CNES
Stavroudis Baffle: a key element to allow the optical performances in the hot thermo-optical environment of Mercury.
Mercury: the elusive planet?
Thanks