



## **DIBS- Ma\_MISS experiment**

**A. Coradini** (1), M.C. De Sanctis(2), A. Ercoli-Finzi(3), E. Battistelli(4), E. Re (4) and P.G. Magnani (4)

(1) Istituto dello Spazio Interplanetario, INAF, Roma , Italy, (2) Istituto di Fisica Spaziale, INAF, Roma, Italy, (3) Politecnico di Milano, Milano, Italy, (4) Galileo Avionica, Firenze, Milano, Italy (Contact Email: [Angioletta.coradini@ifsi-roma.inaf.it](mailto:Angioletta.coradini@ifsi-roma.inaf.it))

In this presentation we will describe the main characteristics of a system - called DIBS (Drill-Integrated Package for Borehole Sciences)- that will be able to study the Martian subsurface by means of different sensors integrated into a drill. This system is an important subsystem of the Pasteur Rover, that will explore the Martian surface and - thanks to DIBS - the Martian subsurface. To date, we have direct observations relative only to the Martian surface and little is known about the characteristics of the first subsurface layers. The possibility to sample subsurface materials, to deliver them to analytic instruments and to record the context of the sampled areas, performing borehole mineralogical analysis, is fundamental to understand Mars weathering processes. The system will be integrated in the Pasteur sample distribution chain, thus providing un-weathered subsurface samples to other instruments. Moreover it will help in understanding if life was ever present on Mars. DIBS system will be able study the subsurface mineralogy of Martian soil and rocks by means of a small spectrometer integrated in the drill, named Ma\_Miss (Mars Multispectral Imager for Subsurface Studies). The Ma\_Miss experiment is located in the drill tool. It includes the optical head of the spectrometer, a lamp to illuminate the borehole walls, and the optical fibre that brings the signal to the spectrometer. The multispectral images are acquired by means of a sapphire window placed on the lateral wall of the drill tool, as close as possible to the drill head. The images are gathered by means of an optical fibre system and analysed using the spectrometer. The instrument is simple, robust, and a prototype has been already developed.