

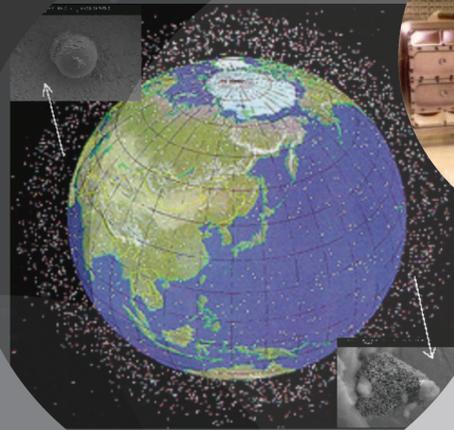
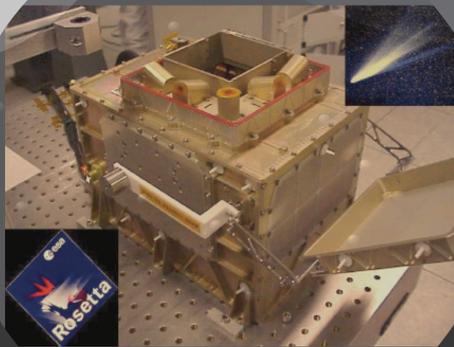
Sensors for detection and analysis of micro-powders

MEASURING SYSTEMS FOR DUST AND VOLATILE COMPOUNDS

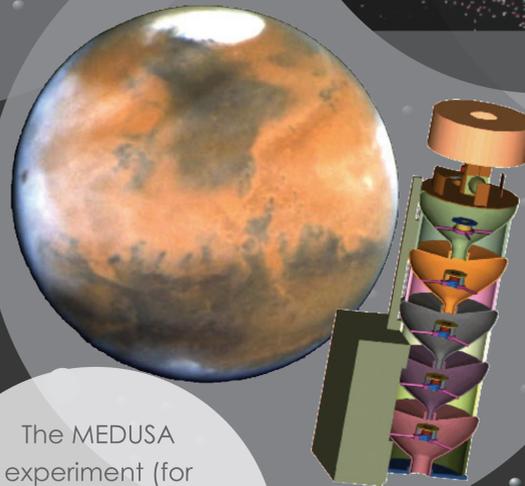
SPACE INSTRUMENTS

The instruments are used to measure physical and dynamic properties of solid particles (from sub-micrometer to centimetre) in various space environments (comets, Mars atmosphere, interplanetary medium around the Earth) and to monitor volatile compounds (water vapour)

The GIADA instrument is on board the European ESA-Rosetta probe and it's flying towards the Churyumov-Gerasimenko comet



AEROGEL catching systems have been externally exposed on the Russian space station MIR, to catch grains of natural origin and/or fragments produced by space human activities (so-called debris)



The MEDUSA experiment (for atmospheric dust sampling) is under study for application to future missions to Mars, such as ESA-ExoMars

METHOD

- Measurement "in situ"
- Sampling, treatment and manipulation
- Laboratory analysis

APPLICATION FIELDS

In every field, wherever it's necessary a precise, reliable and automatic control of the physical, chemical and dynamic properties of solid particles, from sub-micron over, with different concentrations and volatile compounds in various places

EQUIPMENT FOR LABORATORY ANALYSIS

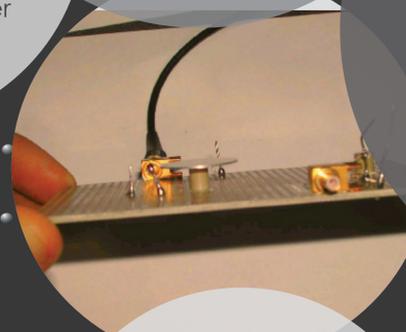
- Scanning electron microscope.
- Spectrophotometers and interferometers (from ultraviolet to IR).
- Systems for chemical (HPLC) and elements (XRD) analysis.
- Systems for laser, thermal, ultraviolet and atomic treatment
- Micro-manipulation equipments

KNOW – HOW & EXPERTISE

INAF researchers achieved a specific know-how on innovative methods and miniaturization techniques to measure the chemical, physical and dynamic properties of solid dust and volatile species with very high precision and sensitive levels

OPTICAL DETECTORS

Single grains with a few micron diameter are revealed by the measure of the light scattered during the crossing of a laser beam



IMPACT DETECTORS

The pulse generated by single grains impacting on an aluminium plate can be measured by piezoelectric sensors

MASS DEPOSITIONS DETECTORS

The deposit of dust and volatile materials can be measured by quartz crystal microbalance devices

