



## **The composition and thermal properties of the nucleus and coma of the comet 67P/Churyumov-Gerasimenko as seen by VIRTIS, the infrared and thermal imaging spectrometer on-board the Rosetta/ESA probe.**

Fabrizio Capaccioni (1), Gianrico Filacchione (1), Stephane Erard (2), Gabriele Arnold (3), and the VIRTIS Science Team

(1) INAF, Istituto di Astrofisica e Planetologia Spaziali, Rome, Italy (fabrizio.capaccioni@iaps.inaf.it), (2) LESIA, Obs. de Paris, Place Janssen, F-92195, Meudon, France, (3) Institut für Planetenkundung – DLR, Berlin

VIRTIS (Visible Infrared and Thermal Imaging Spectrometer) is the spectrometer onboard the Rosetta/ESA mission. VIRTIS is a dual channel instrument, covering the 250nm - 5000nm spectral range, and is composed of: a) a high resolution point spectrometer (spectral range 2-5  $\mu\text{m}$  and a resolution of 3000 at 3 $\mu\text{m}$ ), without imaging capabilities and mainly devoted to the detailed study of the composition of the cometary coma, and b) a hyper-spectral imager which will provide complete coverage of the cometary nucleus (with a maximum resolution of 2.5m) determining its composition and surface thermal properties. The Rosetta probe will accompany the comet 67P/CG throughout its voyage in the inner solar system from 3.5AU through perihelion and after. During this time the Rosetta probe will have the opportunity, in the early phases of the mission, to explore the cometary nucleus. With the substantial contribution of VIRTIS, Rosetta will allow to determine the nature of the solids on the surface (composition of ices, dust and characterisation of organic compounds), to determine the energy balance in the uppermost layers of the nucleus and thus study how a cometary nucleus works. Later on, closer to the Sun, the scientific activity will focus on the monitoring of the surface evolution due to sublimation and erosion, on the study of the outgassing activity and of the dynamics of the jets and outbursts, on the determination of the abundance and the spatial distribution of the gaseous species present in the coma, on the analysis of those species capable of describing the cometary nucleus formation environment. The presentation will provide an overview of the scientific tasks of the VIRTIS experiment and a description of its operations.