

# **Cluster Analysis of PFS data: surface and aerosol mineralogy**

**G. A. Marzo** (1), T. L. Roush (2), S. Fonti (1), V. Formisano (3), R. Politi (1), V. Orofino (1) and A. Dinoi (1)

(1) Astrophysics Laboratory, University of Lecce, via Arnesano, I-73100, Lecce, Italy, (2) NASA AMES Research Center, Moffett Field, CA, USA, (3) IFSI/INAF, via Fosso del Cavaliere, Rome, Italy, (giuseppe.marzo@le.infn.it/Ph. +39 0832 297 550)

The Planetary Fourier Spectrometer (PFS) is the IR spectrometer on-board of ESA Mars Express Orbiter. The PFS spectral data set has been investigated using cluster analysis and focusing on solid materials: aerosol and surface minerals. The results of this survey have been compared with the current knowledge of the planet Mars.

The cluster analysis technique used in this work is an unsupervised statistical multivariate approach able to reduce and explore the large amount of data collected during planetary missions. It divides the data set into classes, named clusters, based on the natural distribution of the data in multivariate space. Scientific meaning is defined by fitting the representative spectra of the clusters using an appropriate Martian radiative transfer model. In this work, the cluster analysis technique applied to PFS data set and the scientific results will be discussed.