

NEED FOR SAM ON MARS !!!
a.k.a. *In Situ Inorganic and Organic Analysis of the Martian Soil,*
on Mars Sample Return Mission

P. Coll, M. Cabane, G. Israël, P. Rannou - Service d'Aéronomie du C.N.R.S. - France
F. Raulin, R. Sternberg - Laboratoire Interuniversitaire des Systèmes Atmosphériques - France
A. Jambon - Laboratoire de Pétrologie - France
H. Niemann and P. Mahaffy

In order to know if life is or has been present at the surface of Mars, the Mars Sample Return mission, in 2005, will include the sampling of sub-surface, at depths where the effects of UV radiations and oxidizing agents are negligible. The last C.N.E.S. symposium (Paris, February 1999) had clearly shown questions from the community concerning the Sample Return, in the frame of the 2005 Mars mission (conservation, possible sterilization during the fly back to Earth...). These interrogations have clearly demonstrated the risk of informations loss during the Sample Return, and also the need of informations about Mars surface and sub-surface before 2008, date of the Sample Return on Earth. For this purpose we propose to perform a preliminary in-situ analysis of Martian samples. To analyze inorganics and organics sampled at various depths, we propose to use the Pyrolysis/Chemical reactor-Gas Chromatography-Mass-Spectrometry technique. This experiment (*SAM: Sample Analysis on Mars*) may be performed using techniques already developed in the frame of other planetary (ACP/HUYGENS) or cometary (COSAC/ROSETTA) missions, which can easily be adapted to the proposed mission objective., and which will reach 3 goals :

- organics research
- inorganics research
- isotopic analysis

This paper will present why it is necessary to have a tool like SAM on Mars, what are the main scientific objectives and will provide a brief description of the measurement strategy.