# Post-Venus Express exploration of Venus : an in-situ mission to characterize Venus climate evolution

**E. Chassefière** (1), K. Aplin (2), C. Ferencz (3), J. Lopez-Moreno (4), J. Leitner (5), B. Marty (6), M. Roos-Serote (7), D. Titov (8), C. Wilson (9), O. Witasse (10) and the VEP team

(1) Institut Pierre Simon Laplace, France, (2) Rutherford Appleton Laboratory, U. K., (3) Institute of Geography and Earth Sciences, Hungary, (4) Instituto de Astrofísica de Andalucía, Spain, (5) Institute for Astronomy, Austria, (6) CRPG, France, (7) Lisbon Astronomical Observatory, Portugal, (8) Max Planck Institute for Solar System Studies, Germany, (9) Oxford University, U.K. , (10) European Space Agency, The Netherlands (eric.chassefiere@aero.jussieu.fr, Fax : +33 144273776)

The planet Venus - our neighbour in the solar system and twin sister of the Earth - was once expected to be very similar to the Earth. However the space missions to the planet discovered a world completely different from ours. The fundamental mysteries in the physics of Venus are related to the composition and dynamics of the atmosphere, physics of the cloud layer and greenhouse effect, surface mineralogy, evolution of the surface and volatile inventory. Despite the fact that both Earth and Venus were formed in the same region of the solar system, the planets followed dramatically different evolutionary paths. Understanding the reasons for this divergence would shed a light on the processes of origin and evolution of all terrestrial planets including Earth.

A new mission to Venus is under study. It consists of a set of probes (balloon probe, descent probes) devoted to the characterization of atmospheric chemical cycles, atmospheric electrical/ electromagnetic activity, low atmosphere dynamics, surface/ atmosphere thermo-chemical interactions, surface mineralogy and geology, with an emphasis on past climate evolution (noble gas/ isotope composition of the atmosphere). Some orbital science is planned, in complement to in-situ science. An atmosphere sample return is also considered. Information about current activity may be found at http://www.aero.jussieu.fr/VEP/, together with documents describing the present state of thoughts about scientific priorities and possible mission scenarios.