EPSC Abstracts,
Vol. 2, EPSC2007-A-00548, 2007
European Planetary Science Congress 2007

The European Venus Explorer (EVE) mission proposal

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The European Venus Explorer (EVE) is a mission proposed to the European Space Agency (ESA) under the Cosmic Vision Call for Ideas, for launch in 2016-2018.

The central goal of this mission is to investigate the evolution of Venus and its climate, in order to understand better the 'life cycle' of Earth-like planets everywhere. After the excellent results being obtained from ESA's Venus Express orbiter, in situ measurements will be required to answer many of the outstanding questions, specially relating to the evolution of the planet, its complex cloud chemistry and the stability of its climate.

The baseline EVE mission consists of one balloon platform floating at an altitude of 50-60 km, one descent probe provided by Russia, and an orbiter with a polar orbit which will perform science observations as well as relay data from the balloon and descent probe. The minimum lifetime of the balloon is 7 days, required for one full circle around the planet, much longer than the 48 hour data returned from Russia's VEGA balloons. Earth-based VLBI and Doppler measurements provide tracking information for the orbiter, allowing measurement of the variations in the planet's gravity field, and for the balloon and descent probe to yield wind measurements in the lower atmosphere. The descent probe's fall through the atmosphere is expected to last 60 minutes, followed by a lifetime of 30 minutes on the surface. The Japanese space agency (JAXA) also proposes to include another independent platform, a small water vapour-inflated balloon which would be deployed at 35 km altitude and would communicate directly to Earth.

Further details of the EVE mission, including proposals for Education & Outreach schemes, can be viewed at the mission website:

http://www.aero.jussieu.fr/EVE/