THE MARS EXPRESS/NASA PROJECT AT JPL

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Introduction: This is the annual update to the U.S. involvement in ESA's Mars Express Mission. The primary objective of this ESA mission is to search for hydrologic resources on the surface of Mars. Mars Express was launched from Baikonur, Kazakhstan on June 2, 2003 and arrived at Mars on December 25, 2003. Prime mission science observations were conducted in January 2004 through November 2005. ESA and NASA have approved support for the first extended mission cycle for spacecraft operations and data acquisitions through September 2007.

ESA selected seven science experiments for the Mars Express orbiter. Some 24 U.S. investigators were selected by ESA and NASA as instrument Co-Investigator, Participating Scientists. NASA and the Italian Space Agency (ASI - Agenzia Spaziale Italiana) are jointly sponsoring an advanced radar sounder (MARSIS). The Mars Express science experiments and sponsoring countries are:

1) ASPERA (Analyser of Space Plasma and Energetic Atoms), Sweden
2) HRSC (High Resolution Stereo Camera), Germany
3) MARSIS (Mars Advanced Radar for Subsurface and Ionospheric Sounding), Italy/United States
4) OMEGA (Observatoire pour la Minéralogie, l'Eau, les Glaces et l'Activité), France
5) PFS (Planetary Fourier Spectrometer), Italy
6) MaRS (Mars Radio Science Experiment), Germany
7) SPICAM (Spectroscopic Investigation of the Characteristics of the Atmosphere of Mars), France

Most of the U.S. participation in ESA's Mars Express Mission is conducted via the Mars Express/NASA Project at the Jet Propulsion Laboratory (JPL) in Pasadena, California.

NASA/U.S. Participation in Mars Express: Mars Express/NASA Project Objectives are:

- Assist in achieving Mars Express science objectives through U.S. Co-Investigator support
- Generate MARSIS subsurface and ionospheric data products
- Deploy NASA's SPICE (Spacecraft, Planet, Instrument, C-matrix, Events) System to ESA and Instrument Teams
- Support the HRSC experiment with distribution of HRSC data to the US Co-investigators
- Secure Deep Space Network (DSN) tracking support
- Conduct DSN radio science observations
- Conduct an OMEGA – Mars Reconnaissance Orbiter HIRISE collaboration
- Conduct UHF relay experiments between the Mars Exploration Rovers (MERs) and Mars Express.

A key NASA objective is to archive Mars Express science investigation data in a format compatible with the Planetary Data System (PDS) via ESA's Planetary Science Archive and a mirror site at the Geosciences Node of NASA's Planetary Data System. The first Mars Express data release was released in February and September 2005.

Support for ASPERA via NASA Discovery Program: Two ASPERA sensors, an Electron Spectrometer and Ion Mass Analyzer, were built by Southwest Research Institute and delivered to the Swedish Space Institute for inclusion in the spacecraft instrumentation. ASPERA addresses how the interplanetary plasma and electromagnetic fields affect the Martian atmosphere, which is directly related to the questions about water on Mars. ASPERA data reduction and archiving is funded by NASA's Discovery Program.