

NASA'S MARS SURVEYOR PROGRAM: FOCUS ON VOLATILES.

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Mars Surveyor is a continuing program of Mars exploration employing investigations conducted from landed and orbiting platforms. The program focuses on the themes of life, climate and resources. These themes are connected by the common thread of water on Mars. The missions to be launched in 1998 as part of this program focus specifically on volatiles and climate history of Mars. This paper focuses on the anticipated studies of Martian volatiles to be made by Mars Surveyor.

The first mission in the program is the Mars Global Surveyor (MGS), an orbiter to be launched in 1996 which recovers much of the science lost with the failure of Mars Observer. MGS has a strong volatile research component. The mission includes investigations of volatiles (both CO₂ and H₂O) on the surface and in the atmosphere utilizing the thermal emission spectrometer (TES), and high resolution and global imaging from the Mars Orbiter Camera (MOC).

In the 1998 opportunity, a lander will be placed on the layered terrain of the, south polar region of Mars. The Mars Volatile and Climate Surveyor (MVAC) focuses on understanding the form, quantity and behavior of surface volatiles using a payload of integrated instruments. The lander will also carry the Mars descent imager (MARDI) which provides contextual information for the lander. In orbit, the pressure modulator infrared radiometer (PMIRI) and Mars color imager (MARCI) will map the sources and sinks of volatiles, as well as tracking their transport over the planet.

Mars Surveyor mission plans include an orbiter and lander to be launched in 2001. The orbiter will carry an improved gamma ray spectrometer (IGRS) which will map reservoirs of surface and near-surface water. While subject to an upcoming Announcement of Opportunity, and consequently not defined, the lander science may continue the in situ study of Martian volatiles.

NASA is also pursuing a joint program with ESA in 2003 that would provide a small network of three landers, carrying geochemistry instruments, as well as other geophysics and geology

sensors. The three surface stations will be supported by an orbiter carrying an atmospheric sounder. Candidate sounders for the orbiter are capable of observing atmospheric water vapor. Return of a sample from the surface of Mars is planned for 2005. It is possible that samples of the atmosphere and of volatiles will be preserved within the return capsule.