

Russia Prepares A Return to Mars

In the first indications of the recovery of Russia's interplanetary exploration program after a decade and a half of budgetary drought, scientists in Moscow have finalized realistic plans for an ambitious robot mission to the martian moon Phobos as early as 2009. They intend to collect soil samples (including a drill core about a meter long) and return them to Earth.

The project name is 'Fobos-Grunt', where 'grunt' is the Russian word for 'dirt'. Although it's been discussed for several years, its formal approval was announced last October in Vancouver, Canada, at the annual International Astronautical Congress meeting.

In Moscow, Dr. Lev Zelyoni, director of the 'Institute of Space Research', added that this probe was the only current Russian planetary mission planned. "The project envisages the construction of an interplanetary craft capable of flying to Mars, landing on Phobos, taking samples of its soil and bringing them back to Earth," he said. About 200 to 300 grams of soil would be returned.

"A long-lived station will remain on Phobos," he added, "which will continue exploring it in an automatic mode. It will monitor the Mars climate and study the space around it." This package will weigh about 50 kg, other scientists said. An American instrument may be included on the spacecraft, and a Japanese microsat may accompany it on its way to Mars.

The flight plan calls for a 350 day voyage from Earth to Mars orbit, where the probe will reconnoiter the surface of Phobos and select a landing spot. After landing, the samples will be quickly collected and a return spacecraft will blast off. It will then linger in Mars orbit for more than a year until a launch window opens for a return to Earth.

In the early 1970's, Soviet scientists had some success with automated sample return missions to the Moon. Because the gravity of Phobos is so much lower than the Moon's, smaller, cheaper rockets can perform this mission. The same basic design for a return capsule can be used with small modifications.

However, the catch is that mission times are vastly longer – about 1000 days, rather than the less than 10 day lunar round trip. Spacecraft lifetime has always been a challenge to Russian space designers, whose equipment tends to break down sooner and more often than Western probes. But recent Russian earth satellites have shown markedly improved longevity.

Phobos was the target of two Russian lander probes in 1988, but one was lost in route due to a computer error and the second went out of control during its final approach to the moonlet. The most recent Russian interplanetary probe, Mars-8, fell back to Earth shortly after launching in November 1996, the victim of severe budget cutbacks as much as of shoddy engineering.