

Daring Russian sample return mission to Martian moon Phobos aims for November liftoff

October 14 2011, By Ken Kremer



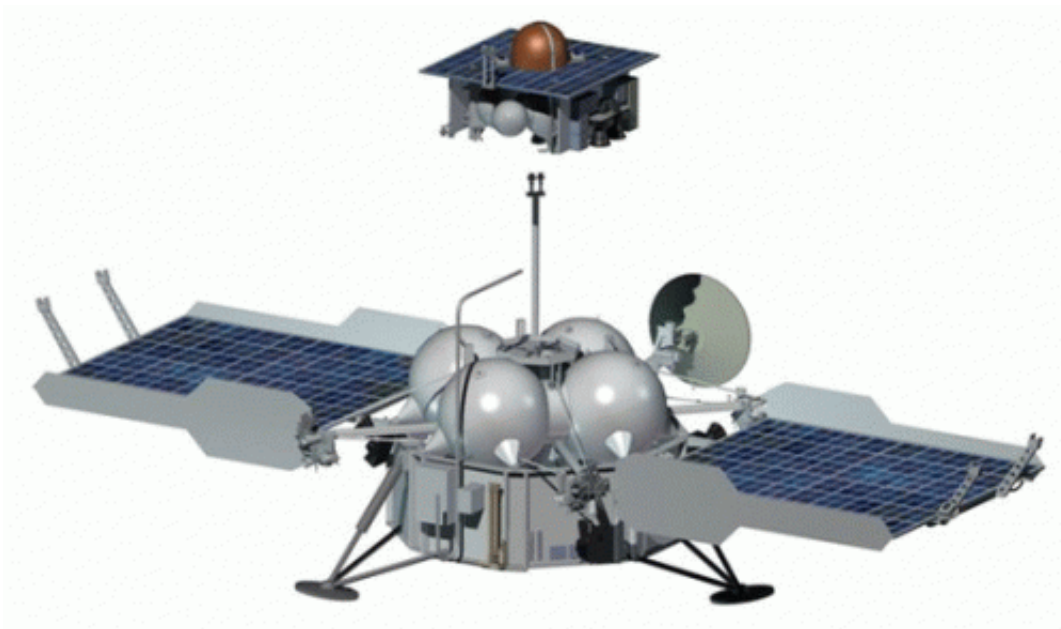
Russian Phobos-Grunt spacecraft set to Launch in November 2011. The flight version of the Phobos-Grunt spacecraft minus its main solar panels is being lowered into a vacuum chamber for thermal, vacuum and electric tests during June 2011. Credit: NPO Lavochkin

In just over three weeks' time, Russia plans to launch a bold mission to Mars whose objective, if successful, is to land on the Martian Moon Phobos and return a cargo of precious soil samples back to Earth about three years later.

The purpose is to determine the origin and evolution of Phobos and how that relates to Mars and the evolution of the solar system.

Liftoff of the Phobos-Grunt space probe will end a nearly two decade long hiatus in Russia's exploration of the Red Planet following the failed Mars 96 mission and is currently scheduled to head to space just weeks prior to this year's other Mars mission – namely NASA's next Mars rover, the Curiosity Mars Science Laboratory (MSL).

Blastoff of Phobos-Grunt may come as early as around Nov. 5 to Nov. 8 atop a Russian Zenit 3-F rocket from the Baikonur Cosmodrome in Kazakhstan. The launch window extends until about Nov. 25. Elements of the spacecraft are undergoing final prelaunch testing at Baikonur.



Phobos-Grunt spacecraft

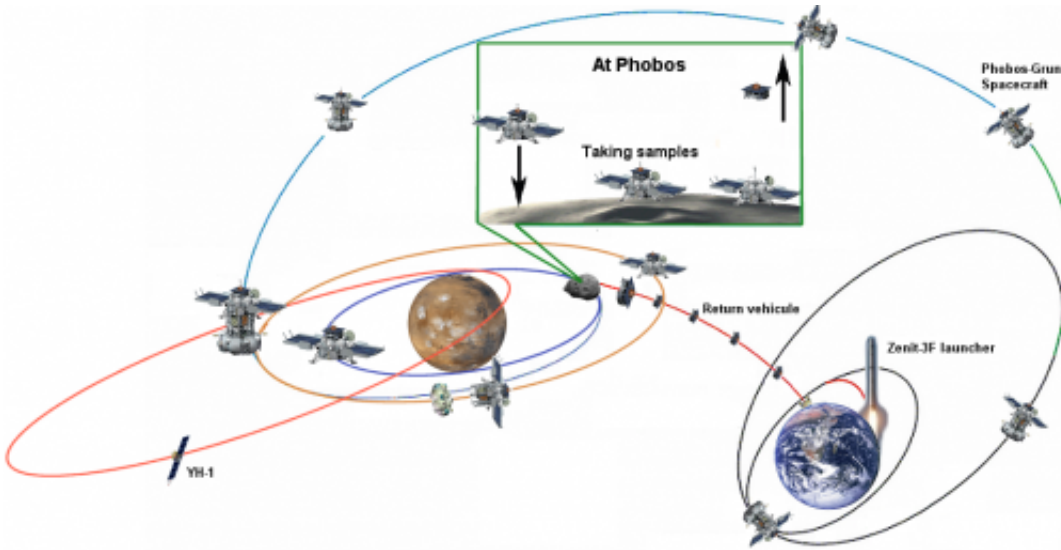
Baikonur is the same location from which Russian manned Soyuz

rockets lift off for the International Space Station. Just like NASA's Curiosity Mars rover, the mission was originally intended for a 2009 launch but was prudently delayed to fix a number of technical problems.

“November will see the launch of the Phobos-Grunt interplanetary automatic research station aimed at delivering samples of the Martian natural satellite's soil to Earth” said Vladimir Popovkin, head of the Russian Federal Space Agency, speaking recently at a session of the State Duma according to the Voice of Russia, a Russian government news agency.

The spacecraft will reach the vicinity of Mars after an 11 month interplanetary cruise around October 2012. Following several months of orbital science investigations of Mars and its two moons and searching for a safe landing site, Phobos-Grunt will attempt history's first ever touchdown on Phobos. It will conduct a comprehensive analysis of the surface of the tiny moon and collect up to 200 grams of soil and rocks with a robotic arm and drill.

After about a year of surface operations, the loaded return vehicle will blast off from Phobos and arrive back at Earth around August 2014. These would be the first macroscopic samples returned from another body in the solar system since Russia's Luna 24 in 1976.



Phobos-Grunt mission scenario. Credit: CNES

“The way back will take between nine and 11 months, after which the return capsule will enter Earth’s atmosphere at a speed of 12 kilometers per second. The capsule has neither parachute nor radio communication and will break its speed thanks to its conical shape,” said chief spacecraft constructor Maksim Martynov according to a report from the Russia Today news agency. He added that there are two soil collection manipulators on the lander because of uncertainties in the characteristics of [Phobos](#) soil.

Phobos-Grunt was built by NPO Lavochkin and consists of a cruise stage, orbiter/lander, ascent vehicle, and Earth return vehicle.

The spacecraft weighs nearly 12,000 kg and is equipped with a sophisticated 50 kg international science payload, in particular from France and CNES, the French Space Agency.

Also tucked aboard is the Yinghou-1 microsatellite supplied by China.

The 110 kg Yinghou-1 is China's first probe to launch to Mars and will study the Red Planet's magnetic and gravity fields and surface environment from orbit for about 1 year.

“It will be the first time such research [at Mars] will be done by two spacecraft simultaneously. The research will help understand how the erosion of [Mars](#)' atmosphere happens,” said Professor Lev Zelyony from the Space Research Institute of the Russian Academy of Science, according to Russia Today.

Source: [Universe Today](#)

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