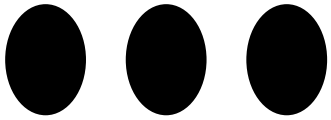
Written by **James Heiser** on November 29, 2011

New NASA Probe on its Way to Mars

Although the speed and maneuverability of the two-ton *Curiosity* rover may not offer much when it comes to travel on Earth, its capacities in both those regards could transform the study of Mars. According to the Jet Propulsion Laboratory's website, *Curiosity* promises to move across the surface of Mars at a speed vastly beyond the capacity of earlier probes:



> Once on the surface, the rover will be able to roll over obstacles up to 75 centimeters (29 inches) high and travel up to 90 meters (295 feet) per hour. On average, the rover is expected to travel about 30 meters (98 feet) per hour, based on power levels, slippage, steepness of the terrain, visibility, and other variables.
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> The rover will carry a radioisotope power system that generates electricity from the heat of plutonium's radioactive decay. This power source gives the mission an operating lifespan on Mars' surface of a full martian year (687 Earth days) or more, while also providing significantly greater mobility and operational flexibility, enhanced science payload capability, and exploration of a much larger range of latitudes and altitudes than was possible on previous missions to Mars.

By comparison, the twin Mars Exploration Rover Mission probes — *Spirit* and *Opportunity* — relied on solar power, and although they both lasted far longer than their projected 90-day mission, both rovers had a maximum speed of approximately 18 meters per hour. But *Curiosity* offers more than flexibility to the exploration of Mars: The rover carries 10 different instruments to evaluate the surface of Mars, providing information about the chemistry of the Martian soil. As noted in an article for the *Christian Science Monitor*:

> These analyses will help address two key questions for a future manned mission: how will Mars' global dust storms affect vehicles and hardware on the planet, and what are the possible toxic effects of Martian dust? NASA is aiming to send humans to Mars in the mid-2030s. But before then, many important questions about the planet will need to be answered.
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> "Another key investigation is to determine if there are resources on Mars that we can use for human missions," [mission co-investigator Doug] Ming said.
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> Data from Curiosity is expected to paint a clearer picture of the environment of Mars, including whether oxygen and water can be extracted from subsurface water ice, or even from the atmosphere itself, Ming said.

The concept of in-situ resource utilization for the exploration of Mars was popularized by Mars Society President Robert Zubrin in his 1996 book, *The Case for Mars*. The concept of using Martian resources

to “live off the land” has become an important aspect of planning human missions to Mars, and thus the data gathered by *Curiosity* could be of great benefit to such planning.

The successful launch of Mars Science Laboratory on the second day of a three-week launch window was a marked contrast to the failure of the recent Russian-Chinese *Phobos–Grunt* probe. *Phobos–Grunt* had a mission which was nearly as ambitious as that which has been assigned to *Curiosity*: If successful, it would have brought the first sample return from the surface of one of the moons of Mars. The probe also carried an experiment for the Planetary Society that was intended to study the survival of microbial life in interplanetary space, and a Chinese satellite which was intended to orbit Mars. For now, the entire *Phobos–Grunt* mission is helplessly orbiting Earth instead, and will likely burn up in the atmosphere in early 2012.

The *Phobos–Grunt* probe is the latest in a long string of Russian failures when it comes to Mars exploration. As noted recently in an article for *The New American*, only roughly one-fourth of all Soviet/Russian missions to Mars from 1960 to the present achieved what could be considered even a partial success; the rest ended in utter failure. The “Space Race” of the 1950s and 1960s was not kind to Soviet efforts to reach the red planet, and Russian President Dmitry Medvedev has been eager to demonstrate how little has changed in his country since the days of the “Space Race.” According to a November 26 story from Reuters, Medvedev may not be prepared to shoot those individuals responsible for the failure of *Phobos–Grunt*, but he may see to it that they are shipped off to prison:

> "Recent failures are a strong blow to our competitiveness. It does not mean that something fatal has happened, it means that we need to carry out a detailed review and punish those guilty," Medvedev told reporters in televised comments.
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> "I am not suggesting putting them up against the wall like under Josef Vissarionovich (Stalin), but seriously punish either financially or, if the fault is obvious, it could be a disciplinary or even criminal punishment," he said.

When Russian politicians openly use the brutality of the Stalin regime as the point of comparison for their own conduct in office, their comments do not bode well for the future of their country, or its space program. However, NASA’s human space program is currently relying on Russia’s Soyuz capsules for flights to and from the International Space Station.

Curiosity is scheduled to land on Mars between 1 and 1:30 a.m. EDT on August 6 of next year.

Photo: AP Images