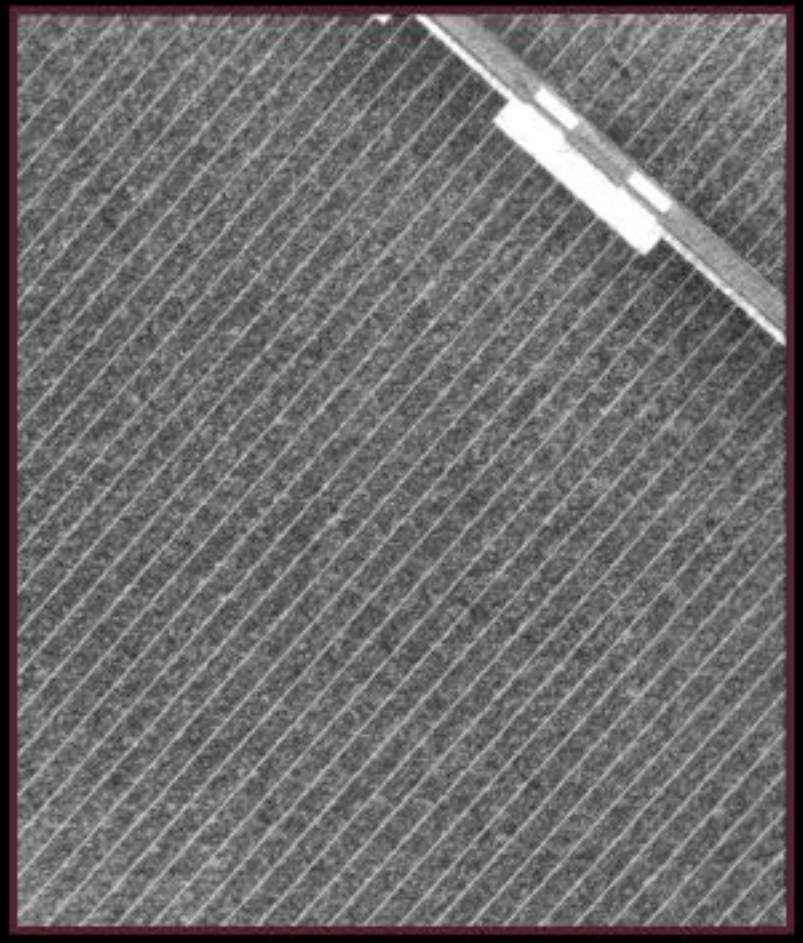
Mars Exploration Rover Mission

Spirit and Opportunity

Month in Review
July 1, 2005 - July 31, 2005

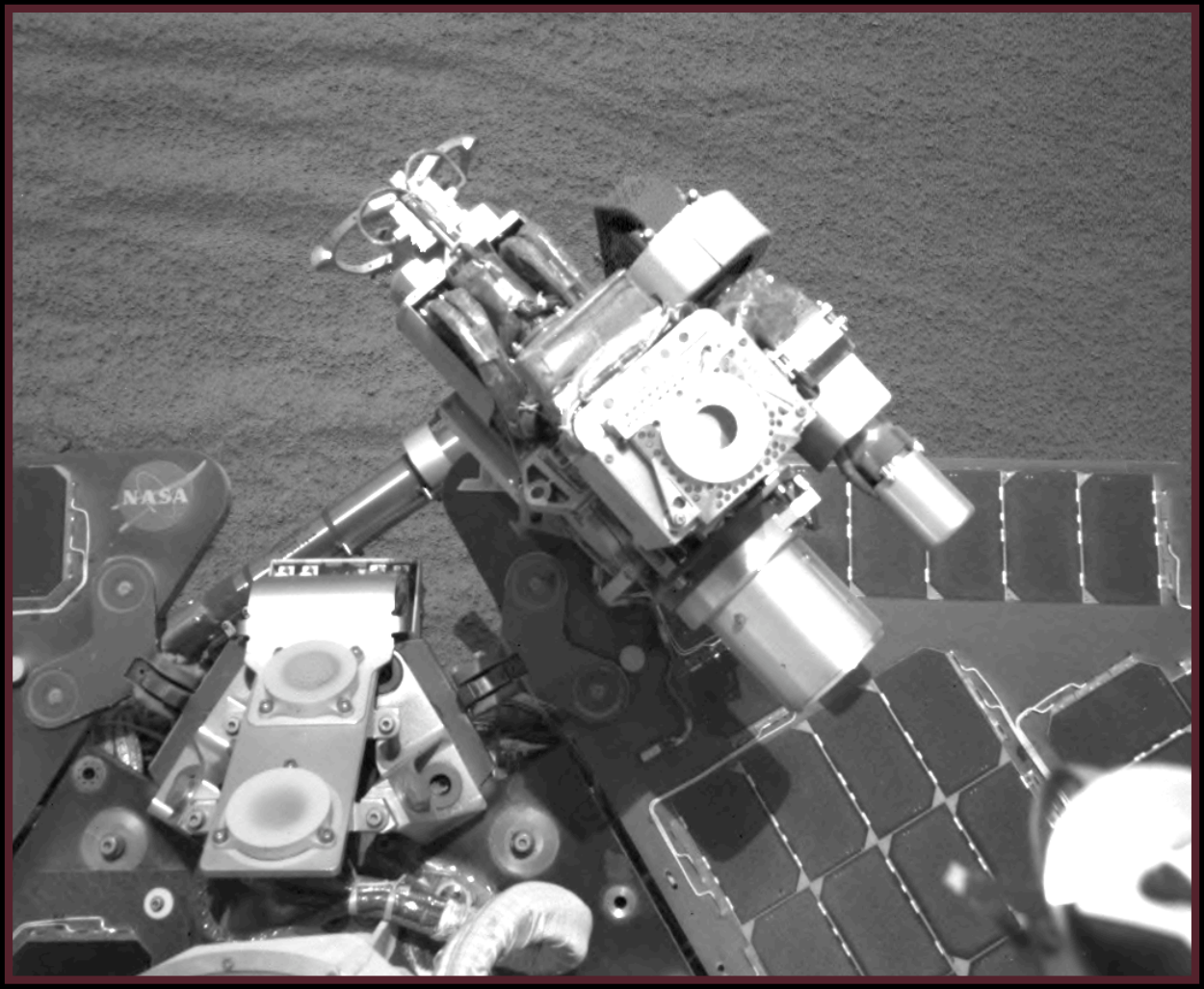
Both rovers are in good health. Opportunity had another “cleaning event” in July when a wind storm swept dust off the solar arrays.

Panoramic camera, July 29, 2005 (sol 538). NASA/JPL/Cornell



Picture of solar panel taken with microscopic imager, July 29, 2005 (sol 538).

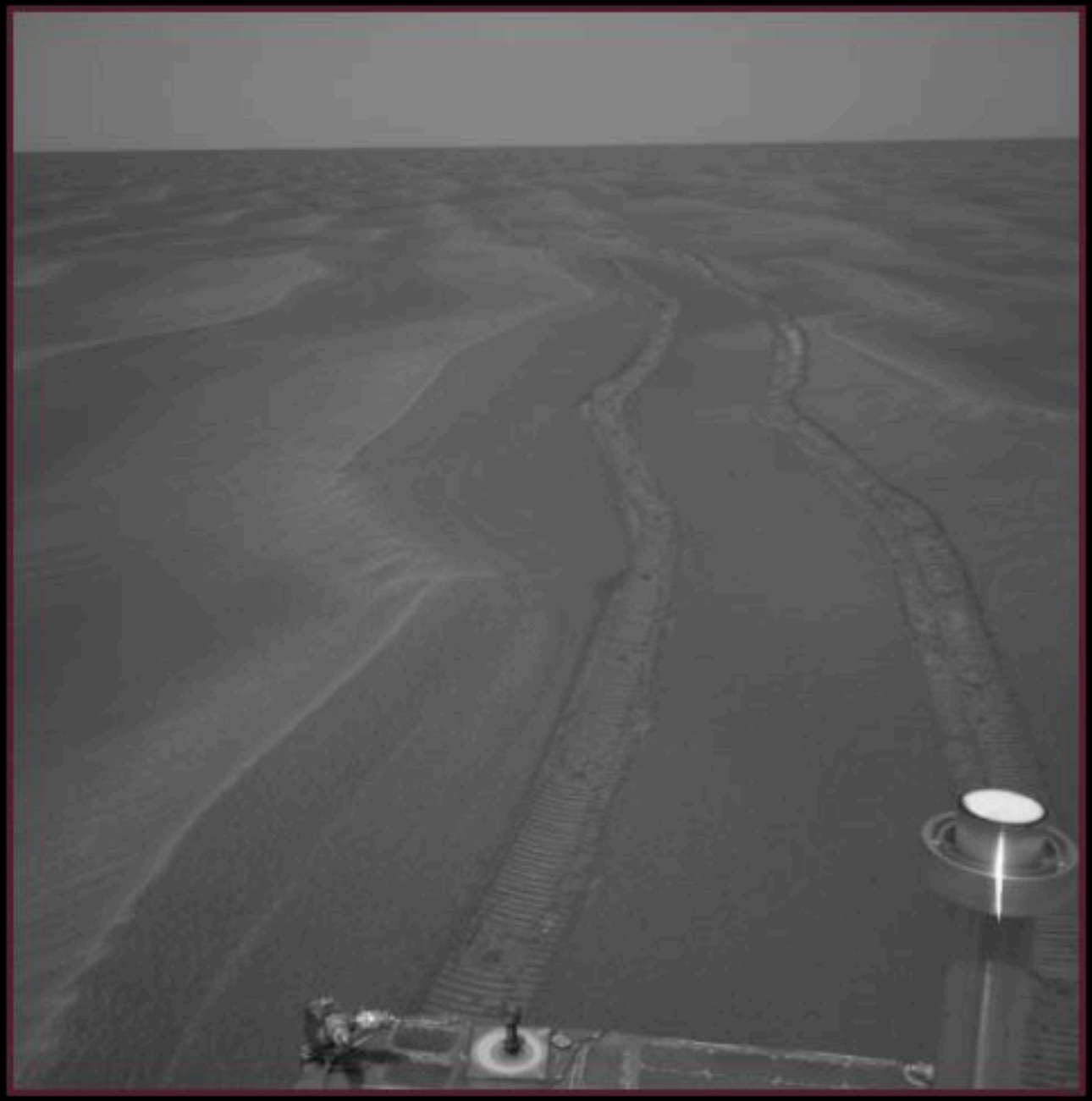
With Opportunity squeaky clean, the solar panels' daily power output increased from 500 watt hours to about 650 watt hours.



Navigation camera image, July 29, 2005 (sol 538).

Full of power and free from “Purgatory Dune,” Opportunity was on the move during the month of July.

Front hazard-avoidance camera, July 1, 2005 (sol 511). NASA/JPL

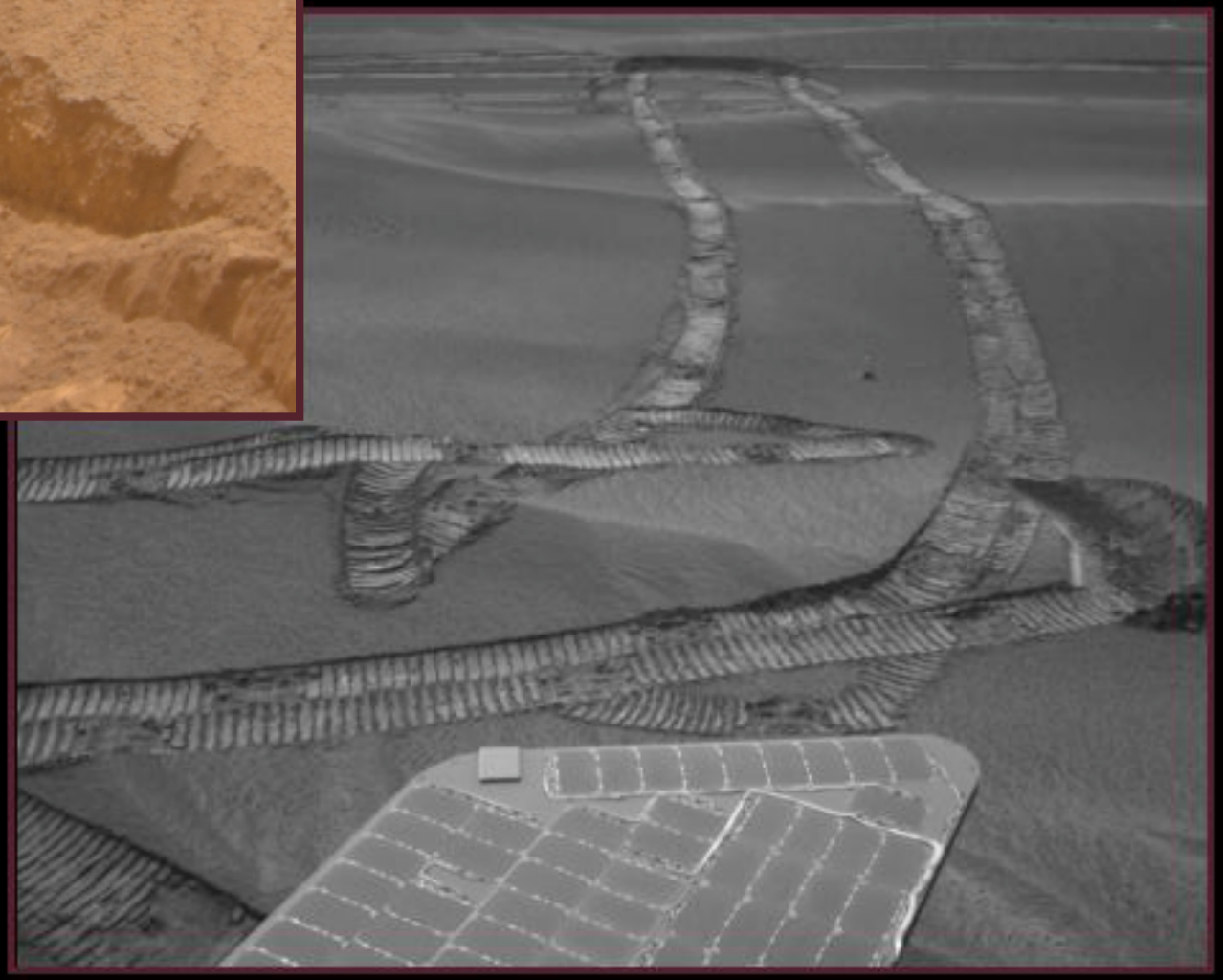


Navigation camera, July 13, 2005 (sol 522). NASA/JPL

Driving through the ripple crests is an interesting challenge for rover drivers.

Drivers must navigate Opportunity through a maze, criss-crossing in between deep troughs to prevent getting stuck in another sand trap.

Panoramic camera, July 1, 2005 (sol 511). NASA/JPL/Cornell



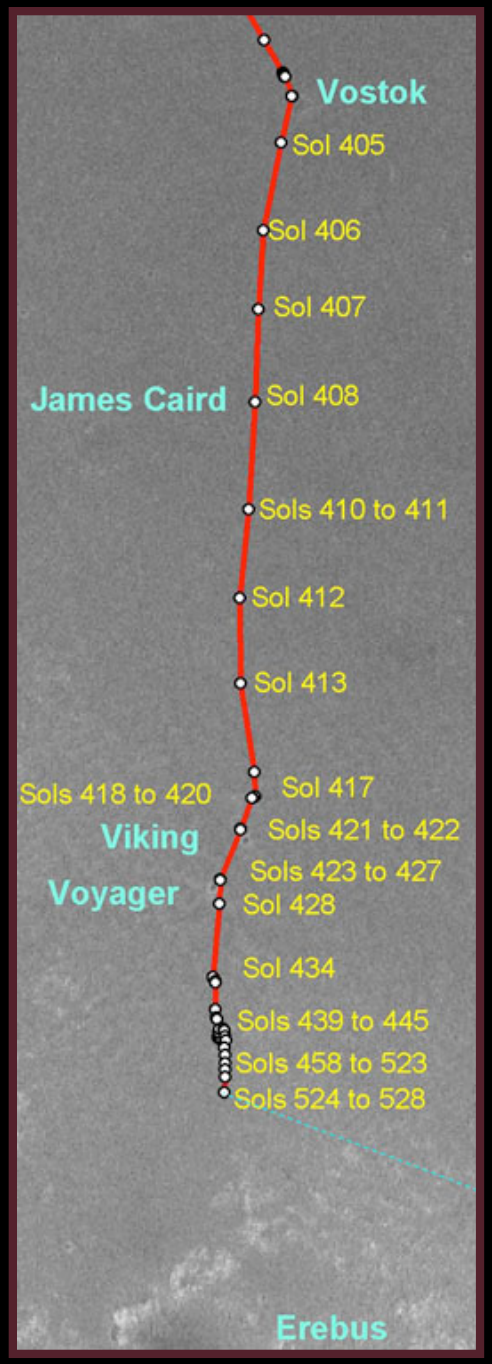
Navigation camera, July 7, 2005 (sol 516). NASA/JPL

Panoramic camera image, July 30, 2005 (sol 539). NASA/JPL/Cornell

After many weeks of traversing through an endless sea of sand, rocks and cobbles began appearing in Opportunity's new surroundings.

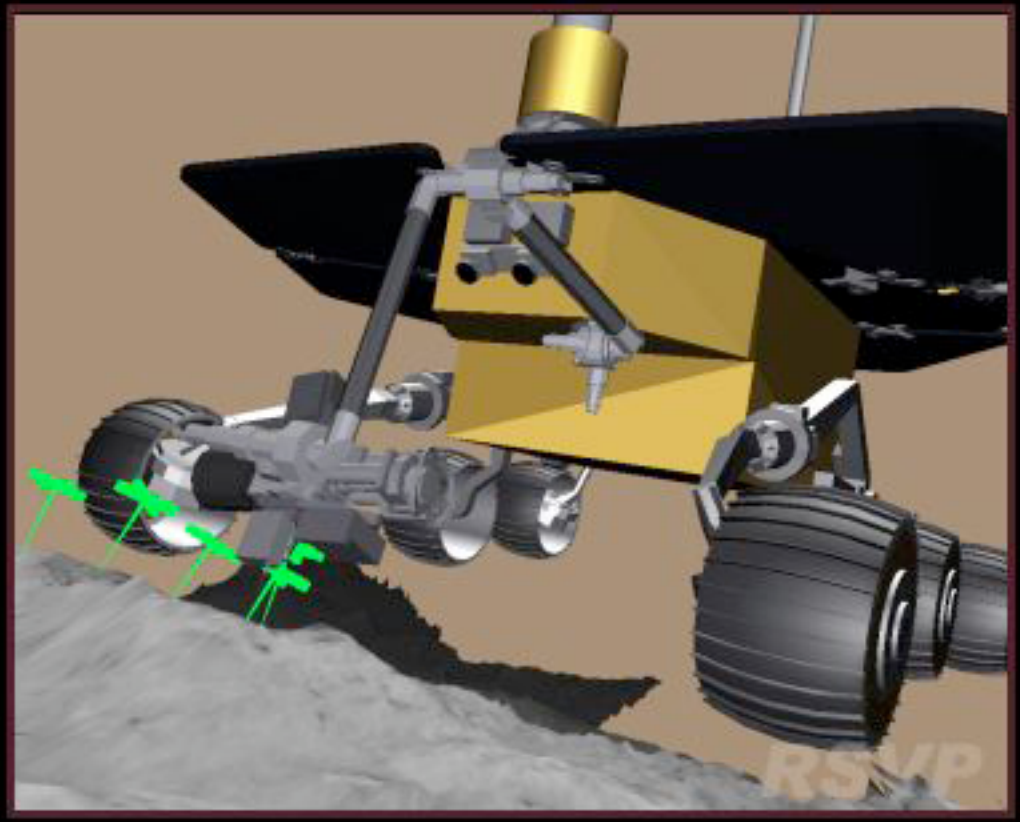
Scientists are anxious for Opportunity to reach "Erebus," an area farther south.

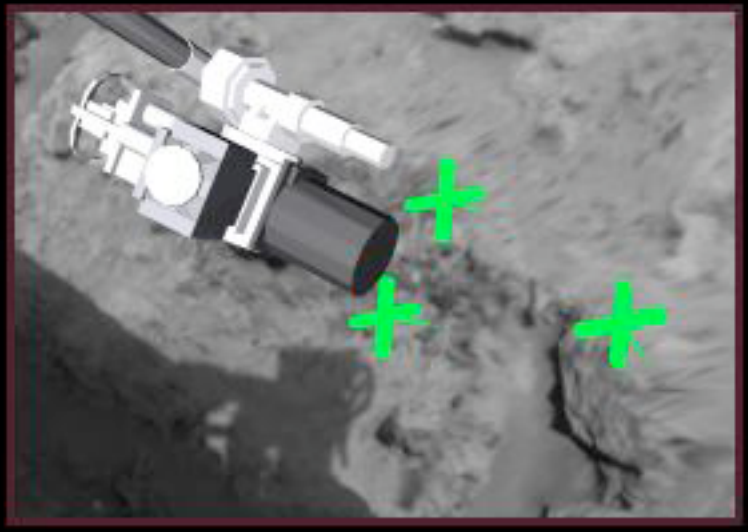
"Erebus" appears to have multiple rock outcrops that might reveal more clues about the history of water on Mars.



Orbital image with graphic overlay of Opportunity's traverse.
NASA/JPL//MSSS/OSU/GIS Laboratory

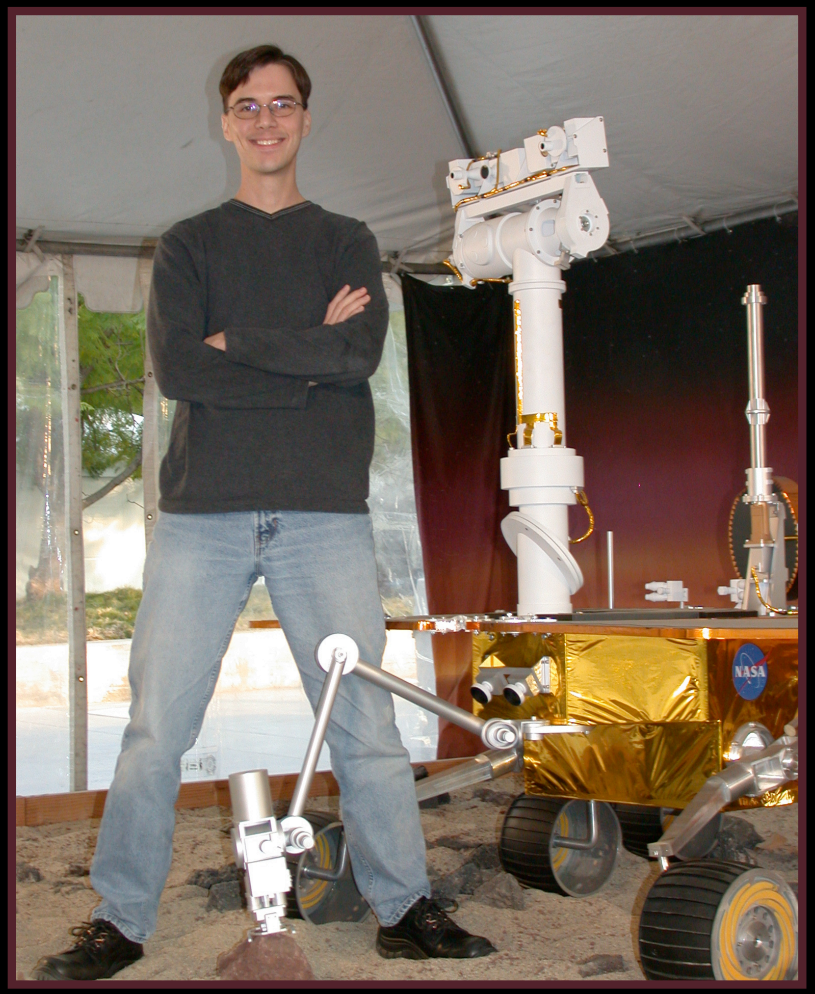
Meanwhile, Spirit has been busy performing science investigations on rocks using instruments on the robotic arm nearly every sol in July.





Rover driver targeting tool images for the rock "Bourgeoisie" on Spirit's sol 557 (July 27, 2005). NASA/JPL/Cornell

For close-range science research to succeed, rover drivers like Scott Maxwell must find the perfect spot to place the robotic arm on Mars (72 million miles away in July).

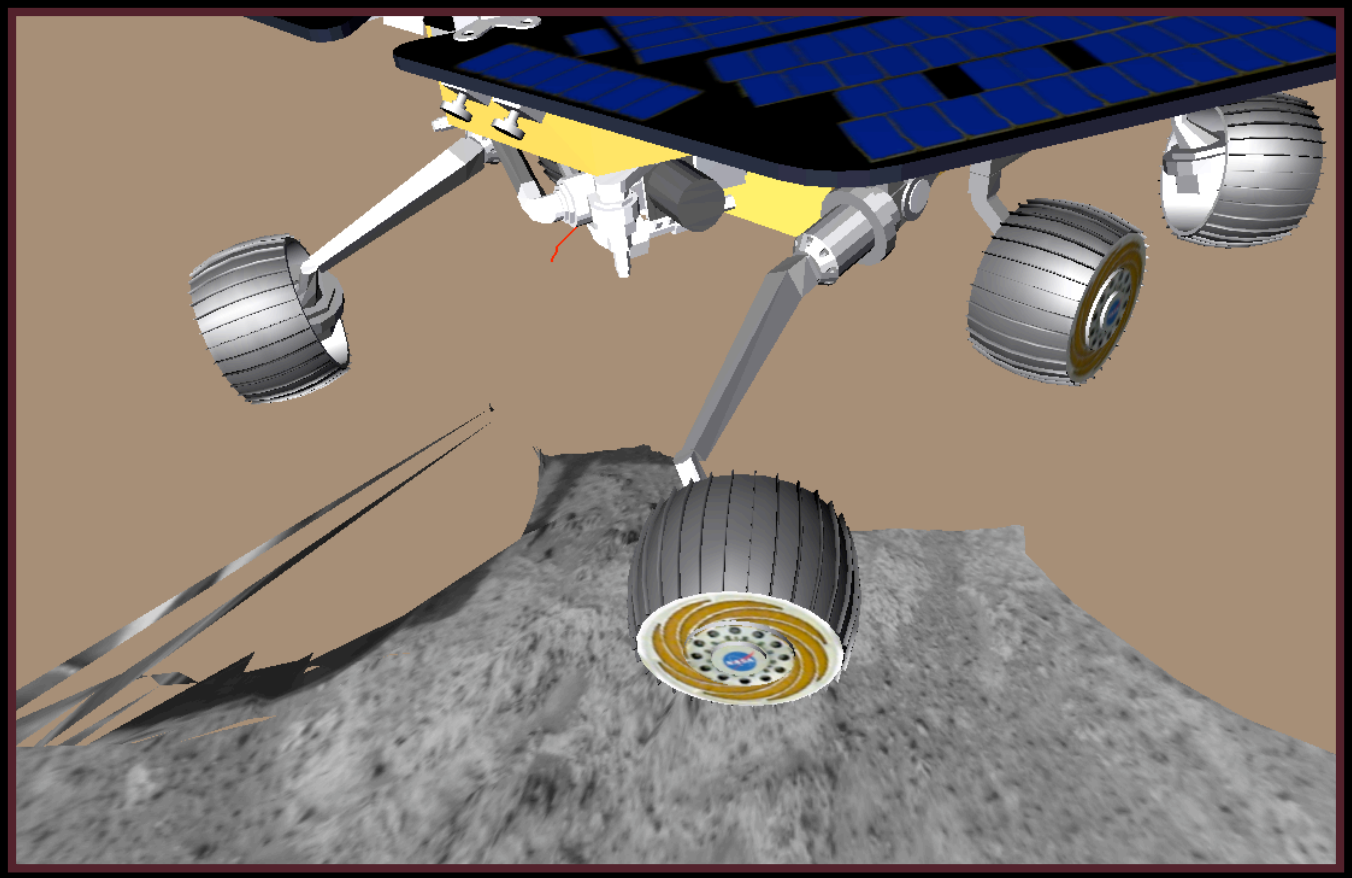


Scott Maxwell standing next to a model of the rover at Jet Propulsion Laboratory.

Over the 4th of July weekend, the science team studied "Independence," and were surprised to find that it seemed to have less iron than expected.

True-color panoramic camera image, July 2, 2005 (sol 532). NASA/JPL/Cornell

Because the grinding teeth on the rock abrasion tool are worn down from use, the team decided to scuff the surface of "Independence" with the front left wheel.



Rover driver targeting tool for the scuffing procedure on "Independence" rock.

(Spirit has worked 450 sols past its original goal, so the team preserves precious resources when it can.)

After the scuff, Spirit studied the newly exposed material with instruments that reveal elements and minerals.

Panoramic camera image, July 8, 2005 (sol 538). NASA/JPL/Cornell

Results are pending.

On July 14, the rover team started informally naming targets using French names in honor of Bastille Day, France's version of Independence Day.

Microscopic imager, July 27, 2005 (sol 557). NASA/JPL/Cornell

Some of the names chosen included: "Gallant," "Gentil" (nice), and "Chic."

True-color Panoramic camera, July 25 (sol 555). NASA/JPL/Cornell

Spirit has found an incredible variety of rocks as the rover climbs Husband Hill.

True-color panoramic camera, July 24 (sol 545). NASA/JPL/Cornell

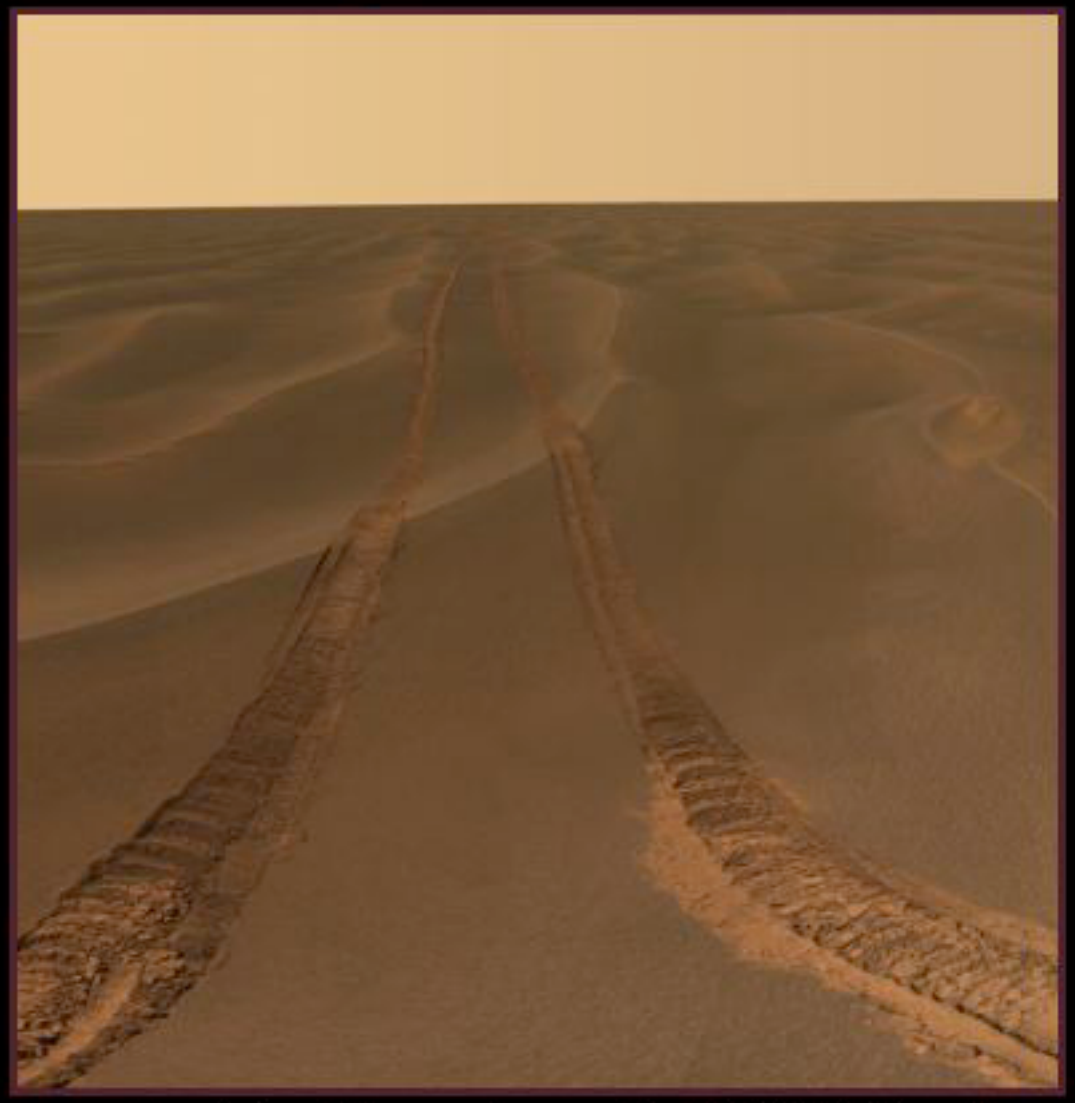
Much of the mysterious soil is composed of very large, often angular grains embedded in finer-grained materials.

True color panoramic camera, July 20 (sol 550). NASA/JPL/Cornell

Opportunity has driven over 3.54 miles, and will continue making its way toward Erebus.

Spirit will continue investigating rocks as it climbs to the top of Husband Hill.

Spirit front hazard-avoidance camera, July 30, 2005 (sol 560). NASA/JPL



Opportunity partial panoramic camera, May 2005.NASA/JPL/Cornell