Both of JPL's Mars Exploration Rovers have completed their originally planned mission and are tackling extra-credit assignments. Spirit and Opportunity have completed all the primary objectives of the mission," said Orlando Figueroa, director of the Mars Exploration Program at NASA Headquarters. "The terrific success achieved is a tribute to a superb team whose commitment to excellence, and keeping the public engaged, is hard to match."

Opportunity finished its 90th martian day of surface operations on April 26. That was the last of several criteria set in advance for full mission success. Spirit passed its 90-day mark on April 5. Both rovers have met all goals for numbers of locations examined in detail, distances traveled, and scientific measurements with all instruments. Both rovers are healthy. In early April, NASA approved funding for extending operation of Spirit and Opportunity through September.

"This brings Opportunity's primary mission at Meridiani Planum to a resounding and successful close. It's stunning to think through the short history of this vehicle," said Matt Wallace. Opportunity mission manager at JPL, where rover assembly began barely two years ago. In its three-month primary mission, Opportunity drove 811 meters (more than half a mile) and sent home 15.2 gigabits of data about Mars, including 12,429 images.

Opportunity found other rock exposures in late April similar to the ones near its landing site that yielded evidence for a body of salty water covering the area long ago. Instead of spending many days to examine those rocks, controllers told the rover to go to the rim of a 130-meter-wide (approximately 430-foot-wide) crater informally named "Endurance."

When Opportunity sends home a view into Endurance Crater, scientists and engineers will begin deciding whether the rover should try to enter that crater. "We're coming up on a major branch point in the mission," said Dr. Scott McLennan of the State University of New York, Stony Brook, a member of the rovers' science team. "Can we get down into Endurance? Can we get back out?"

In mid-April, Opportunity paused beside a crater dubbed "Fram," less than one-tenth the size of Endurance Crater. It examined a rock studded with small, iron-rich spherules that are one part of the evidence for past water in the region. The rover used its rock abrasion tool to grind a hole. This allowed examination of the interior of the rock, called "Pilbara."

McLennan said, "Pilbara is a dead ringer for McKittick," a rock target in the outcrop Opportunity examined in February and March. Another rock at Fram showed hints that it might provide the best-yet evidence about how minerals precipitated out of solution as the ancient body of water evaporated. "It's something that would be of interest to come back and study more if we don't see something of even greater interest along our way," he said. Images of Endurance Crater from a distance seem to show much thicker layers of outcrop than Opportunity has been able to reach so far.

Improvement to the rovers' mobility from new software has expanded options for planning their explorations. Spirit and Opportunity drove farther in April than in the previous three months combined. As of the end of April, Spirit has traveled more than 1.2 kilometers (three-fourths of a mile), and has another 1.9 kilometers (more than a mile) to go before reaching highlands informally named "Columbia Hills." Scientists hope to examine rock layers older than the volcanic plain Spirit has been crossing. In late April, Spirit crossed from an area dominated by material dispersed by crater-forming impacts into an area with fewer rocks. "We are transitioning into a geologically different region. Nothing could be more striking evidence of this than the view ahead of a landscape that has fewer and smaller rocks than the region explored so far," said Dr. Dave Des Marais, a rover science team member from NASA Ames Research Center, Moffett Field, Calif. Scientists are using Spirit's observations at ground level to check ideas about the region's geology based on observations from orbiting spacecraft. That could improve interpretation of orbital data for the whole planet. Spirit will systematically survey the soils, rocks and other features on the plains as it continues toward Columbia Hills, with arrival planned for mid to late June.

Image mosaic from Opportunity's panoramic camera from approximately 70 meters (about 230 feet) from the rim of "Endurance Crater" on the rover's fifth sol on Mars, in late April. The foreground highlights the now-familiar ripples and dimples, common on the plains of Meridiani Planum.
The site covers 32 current and past JPL missions and studies. Each contains its own educational lesson.

For example, kids can "blast off" for a Mars Adventure; solve gravitational waves crosswords; or make their own spinners to help them locate constellations. The Advanced Spacecom project offersyar a Solar Extreme Radiation and Emission Radiometer (ASTER) game shows them how to look at infra-red and visible light.

If kids get hungry, there are simple recipes for artificial pizzas or Moon cookies.

The new Space Place site helps students learn all about the solar system, stars, Earth sciences and technology. A version of the site is also available in Spanish. Fisher said site visitation has grown to about 10,000 unique views a day.

To see the new and improved Space Place, visit http://spaceplace.nasa.gov.
It’s not too late to help make this Open House an even greater event. If you can volunteer a half-day, full day or both days, call Public Services at ext. 4-0112.

Earth

Earth Science
Come see your home planet through the eyes of JPL’s armada of satellites and instruments, which continuously study Earth’s land, seas and sky. The images, beautiful by themselves as pieces of art, provide us with keen insights into how our Earth system ticks.

Image Processing
Learn about the unique capabilities of the nine cameras on the Multi-angle Imaging Spectro-Radiometer. See stereo and 3-D images of Earth, as well as videos and animation. Find out what this successful instrument is telling us about Earth’s surface, clouds and particles in the air.

Solar System
• Check out JPL’s sample-return missions, Stardust and Genesis.
• Collect planetary trading cards and ask an astronomer about the upcoming Pluto flyby, happening in June.
• Learn about how Project Prometheus is making strategic investments in space nuclear fission power and electric propulsion technologies. The Jupiter Icy Moons Orbiter is the first proposed mission within Project Prometheus.
• Hear from Voyager, now the most distant human-made object in the solar system.
• Discover how the New Millennium Program “road-tests” tomorrow’s technologies.
• See a model of the Deep Impact spacecraft, the first mission to look inside a comet.

Technology
Robots, Cutting-Edge Technology, New Methods
• Watch URBIE the rover and Spiderbot the robot.
• Discover the latest in optical communications, from lasers to radio frequencies.
• Check out the advanced rockets that launch JPL missions.
• Talk with engineers and scientists about the importance of mission safety and success — how JPL and NASA are lowering costs and risks of technology development for future explorers.

Microdevices Laboratory
The cutting edge of small space technology. Check out the latest in microchip, sensor and quantum infrared detectors. These help provide power and digital capabilities for instruments on many spacecraft.

Multi-mission Image Processing Laboratory
Experience space science data processing, view animations, 3-D images, high-definition television, and a 3-D movie with the latest images from Mars.

Special Activities
• The Mars Show — van Kármán Auditorium. Shows approximately every 30 minutes.
• Ring World. Building 167 conference room. Shows approximately every 45 minutes.
• Journey to the Planets and Beyond. Building 180-101. Shows approximately every 45 minutes.
• Solar System Walk. Take a walk through a scale model of the solar system, starting at the entrance to Open House and stretching the length of JPL.

Mars
Mars Reconnaissance Orbiter
Slated for launch in August 2005, MRO will study the martian surface and atmosphere in never-before-seen detail, returning 15 times more data from previous missions and images of objects measuring only a few feet across.

Mars Exploration Rover Mission
The twin rovers have been exploring Mars since January, and are now in an extended mission.

Odyssey and Global Surveyor
See models of the orbiters and an impressive display from their mission photo albums.

Just for Kids
Especially for school-age children. Learn about space exploration through demonstrations, audience participation and exhibits.
• Child Educational Center. Hands-on activities for pre-school-age children.
• Solar System Exploration Kids’ Area. Planet tactile, coloring, stickers of Saturn, trading cards and ask an astronomer about the importance of mission safety and success.
• Solar System Exploration Kids’ Area. Planet tactile, coloring, stickers of Saturn, trading cards and ask an astronomer about the importance of mission safety and success.

Universe
The Search for Other Life
Is there another Earth out there? Are we alone? Come and see how missions like the Kepler, the Space Interferometry

Mission and the Terrestrial Planet Finder will take us closer to finding that special planet that might have life. And explore other mysteries of deep space that give us clues about how planets, stars and galaxies formed a long time ago. See how missions like the Spitzer Space Telescope, Galaxy Evolution Explorer and Lunar Interferometer Space Antenna will help answer another age-old question — where did we come from?

Cool Demonstrations
See your own face and hands transform through a heat-sensitive camera, learn how scientists experiment with weightlessness without going into space, discover why we have to put telescopes in space and why the stars “wobble.”

General Information
Parking, Lab Access
Several buildings will be used as display venues. Buildings open at least partially to the public include: 167, 168, 170, 180, 186, 190, 202, 230, 249, 303 and 317. Prior to the event, staff are reminded to lock office doors and properly secure sensitive items, equipment and material to prevent theft, damage or disclosure. In addition, personnel should challenge anyone without proper identification in closed buildings and report the incident immediately to JPL Security (4-3530).

Additional security measures will be in place. Specifically, all vehicles, persons and possessions will be subject to inspection. Prohibited items include backpacks, ice chests, alcohol, controlled substances, weapons, dangerous devices, explosives, skateboards, skates, roller blades and pets (except guide animals).

The Main Gate will be reconfigured so that traffic will be restricted to outbound tour buses and emergency vehicles only. Badged employees working on the day of the event may park on lab but must arrive through the South Gate. To maximize parking for non-JPL visitors, employees are strongly encouraged to park in lots located north of Explorer Road. Staff attending the Open House with visitors must park in areas designated for guests and enter the Laboratory through the pedestrian checkpoint at the Main Gate.

Visitors may park in the West Lot, Blue Lot (accessible from the West Lot), East Lot and Arroyo Lot. Visitors must ride parking lot buses from the East Lot and Arroyo Lot to the Main Gate. Walking from in the East Gate or South Gate will not be permitted either day of the event.

Emergencies may be reported to JPL Security by calling 911 from a Lab extension or 818-393-3333 from a cell phone.
**Letters**

A very sincere thank you to all of my co-workers who not only recognized and congratulated my retirement after 38 years but will always appreciate the challenges and successes I shared with many of you. The past 38 years has been a challenging and rewarding time in my life. Thank you as well to all the families and friends.

Kirk Greifelti

In memory of A. Robin Fredericksen

Thank you to JPL and call colleagues, employees and contractors and their families. You have been there for me all the way.

Christine Fredericksen

**Classifieds**

**For Sale**

**APPLIANCE** -- **Furniture**

HOME & CONSTRUCTION MACHINERY: 1998 model 4x4 Ford Super Duty. 225 HP turbo, $12,500. 2003 Freightliner Columbia, 18 ft box, air brakes, AM/FM stereo, CD player, $7,900. 2000 Ford F450, 6.7L turbo, 15 ft box, air brakes, AM/FM stereo, CD player, $9,000. 2001 Ford F350, 6.7L turbo, 15 ft box, air brakes, $9,500. 2007 Ford F350, 6.7L turbo, 15 ft box, air brakes, $10,000. 2004 Peterbilt 357, 32 ft box, air brakes, $20,000. 2007 Peterbilt 388, 40 ft box, air brakes, $24,000. 2007 Peterbilt 388, 40 ft box, air brakes, $25,000. 2007 Peterbilt 388, 40 ft box, air brakes, $26,000. 2007 Peterbilt 388, 40 ft box, air brakes, $27,000. 2007 Peterbilt 388, 40 ft box, air brakes, $28,000. 2007 Peterbilt 388, 40 ft box, air brakes, $29,000. 2007 Peterbilt 388, 40 ft box, air brakes, $30,000.

**Home & Garden**

**FAN** -- **FURNITURE**

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