Cassini discovers two new moons
By Carolina Martinez

With eyes sharper than any that have peered at Saturn before, the Cassini spacecraft has uncovered two moons that may be the smallest bodies so far seen around the ringed planet.

The moons are approximately 3 kilometers (2 miles) and 4 kilometers (2.5 miles) across—smaller than the city of Boulder, Colo. The moons, located 194,000 kilometers (120,000 miles) and 211,000 kilometers (131,000 miles) from the planet's center, are between the orbits of two other saturnian moons, Mimas and Enceladus. They are provisionally named S/2004 S1 and S/2004 S2. One of them, S/2004 S1, may be an object spotted in a single image taken by JPL's Voyager spacecraft 23 years ago, called that time S1971 S1.

One of our major objectives in returning to Saturn was to survey the entire system for new bodies," said Dr. Carolyn Porco, imaging team leader, Space Science Institute, Boulder, Colo. "Porco planned the imaging sequences. "So, it's really gratifying to know that among all the other fantastic discoveries we will make over the next four years, we can now add the confirmation of two new moons, skipping unnoticed around Saturn for billions of years until now."

The moons were first seen by Dr. Sebastien Charoz, a planetary dynamist working with Dr. Andre Brahic, imaging team member at the University of Paris. "Discovering these faint satellites was an out-of-the-ordinaryмеча, principal investigator for the Genesis Project Manager Don Swann of JPL. "But this time, the Genesis capsule will be the star.""

The capsule—carrying the agency's first sample return since the final Apollo lunar mission in 1972 and the first material collected beyond the moon—will enter Earth's atmosphere at 9:55 a.m. Mountain Time. Two minutes and seven seconds after atmospheric entry, while still flying supersonically, the capsule will deploy a drogue parachute at 33 kilometers (188,000 feet) altitude. Six minutes after that, the main parachute, a parafoul, will deploy. 6.1 kilometers (20,000 feet) up. Waiting below will be two helicopters, each with flight crews of three.

"The lead helicopter will deploy an 18 1/2-foot pole with what you could best describe as an outpouring of "Civics" suggests that water may one have been active at Gusev: "We have evidence that interaction with liquid water changed the composition of this rock," said Dr. Steve Squyres of Cornell University, principal investigator for the science instruments on both rovers. For more details, visit http://marsrovers.jpl.nasa.gov.

In a dramatic ending that marks a beginning in scientific research, JPL's Genesis spacecraft is set to swing Earth and jettison a sample return capsule filled with particles of the Sun that may ultimately tell us more about the genesis of our solar system.

On Sept. 8, the drama will unfold over the skies of central Utah when the spacecraft's sample return capsule will be snagged in midair by a parafoil, will deploy 6.1 kilometers (20,000 feet) up. Waiting below will be two helicopters, each with flight crews of three. The lead helicopter will deploy an 18 1/2-foot pole with what you could best describe as an outpouring of "Civics" suggests that water may one have been active at Gusev: "We have evidence that interaction with liquid water changed the composition of this rock," said Dr. Steve Squyres of Cornell University, principal investigator for the science instruments on both rovers. For more details, visit http://marsrovers.jpl.nasa.gov.

Scientists expected that moons as small as S/2004 S1 and S/2004 S2 might be found within gaps in the rings and perhaps near the F ring, so they were surprised these small bodies are between two major moons. Small comets careening around the outer solar system would be expected to collide with small moons and break them to bits. The fact that these moons exist where they do might provide limits on the number of small comets in the outer solar system, a quantity essential for understanding the Kuiper Belt of comets, and the cratering histories of the moons of the giant planets. "A comet striking an inner moon of Saturn moves many times faster than a speeding bullet," said Dr. Luke I. Jones, an imaging team member from the Southwest Research Institute, Boulder, Colo. "If small, house-sized comets are common, these moons should have been blown apart many times by cometary impacts during the history of the solar system. The disrupted moon would form a ring and then most of the material would eventually gather back together into a moon. However, if small comets are rare, as they seem to be in the Jupiter system, the new moons might have survived since the early days of the solar system."

Moons surrounding the giant planets generally are not found where they originally formed because tidal forces from the planet can cause them to drift from their original locations. In drifting, they may sweep through locations where other moons disturb them, making their orbits eccentric or inclined relative to the planet's equator. One of the new moons might have undergone such an evolution.

Upcoming imaging sequences will scour the gaps in Saturn's rings in search of moons believed to be there. Meanwhile, Cassini scientists are eager to get a closer look, if at all possible, at its new moons.

The Cassini-Huygens mission is a cooperative project of NASA, the European Space Agency and the Italian Space Agency. JPL manages the mission for NASA's Science Mission Directorate. For information about the mission and related web sites, visit http://www.nasa.gov/cassini. Images are also available at the Cassini imaging team home page, http://ciclops.org.

Gusev Crater bedrock hints at watery past
By Gay Webster

Now that JPL's Mars Exploration Rover Spirit is finally examining bedrock in the "Columbia Hills," it is finding evidence that Mars has thoroughly altered some rocks in Mars' Gusev Crater. Spirit and its twin, Opportunity, completed successful three-month primary missions in April and are returning bonus results during extended missions. They remain in good health though beginning to show signs of wear. On Opportunity, a tool for exposing the insides of rocks stopped working on Aug. 15, but engineers are optimistic that the most likely diagnosis is a problem that can be fixed soon. "It looks like there's a pebble trapped between the cutting heads of the rock abrasion tool," said Chris Salvo, the rover mission manager at JPL. "We think we can treat it by turning the heads in reverse, but we are still evaluating the best approach to remedy the situation." It took Spirit half a year to reach bedrock in Gusev Crater. Now, Spirit's initial inspection of an outcrop called "Civics" suggests that water may once have been active at Gusev: "We have evidence that interaction with liquid water changed the composition of this rock," said Dr. Steve Squyres of Cornell University, principal investigator for the science instruments on both rovers. For more details, visit http://marsrovers.jpl.nasa.gov.

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The Solar System Exploration Pro-
grams Directorate (Organizational 600) will be renamed the Mars Exploration
Directorate and will have formulation, implementa-
tion and operations respons-
sibility for all Mars missions.

The Space Network Antenna
(Directorate 800) has also been
renamed the Space Network
Directorate and will have formu-
lation, implementation and operations responsibility
for Cassini and all competing
solar system missions. CHRS JONES
will continue as the director; DR. JOHN
MCNABB has been appointed deputy
director as an additional duty and will assume
role when the transition of the Discovery/New Fron-
tiers Program Office is complete.

An Aug. 12 ceremony on the Mesa marked the installation of a new 6-
meter antenna, one of two that will be used in the new facility in conjunction
with a 12-meter-diameter antenna, all located at the Oak Grove
campus, to create a three-station broad daylight communications
array. The Microwave Array Project for the Deep Space Network is developing
an operational concept, plan and low-cost technologies to increase its overall
signal reception capability by orders of magnitude.” said Mark Gatti, the
project’s lead systems engineer and deputy manager of the Communications
Ground Systems Section 333.

The current concept is to construct three clusters, each of four low-cost
12-meter-diameter antennas.” Gatti said. Each cluster will be located at that
latitude around the Earth, as are the three 1985 facilities in Goldstone,
Canopus and Canberra. The system, operating at frequencies four times
greater than currently used, will provide a total performance increase of 40
times that provided by the system of 76-meter diameter antennas.” Gatti added.

The broad daylight array—two 6-meter antennas on the Mesa antenna
range, a 12-meter antenna located above Building 243 on Oak Grove Road, and
eventually one 6-meter antenna on the Caltech campus—will be used to
develop both the technologies associated with arraying a large number of
antennas for deep-space communications, as well as low-cost manufacturing
methods required to construct this system in a cost-effective manner.

Activities associated with the broad daylight will be planned for the next two
years, the director said. “Expanding to be completed by 2013, the system will
provide the foundation for the future of the DSN, allowing greatly increased capacity
for science missions through the following 30 years.”

For the period of June through July 2004 the following JPL recipients celebrated 25 or more years of service and were invited to attend a luncheon and ceremony in their honor on Aug. 3.

45 years: L.L. Zottarelli.
40 years: Alan Eisenman. Richard Hertel, Samuel Petty, James Randolph.
35 years: Stewart Collins, Larry Dean, Manuel Franco, Krista Kelly, Robert Kukol, Robert Stuken, Thomas Linwood.

Mars software honored by NASA

NASA has selected a data visualization and simulation software package
to be added to the JPL software library, and a new technology that can be used
in aerospace and industrial flow fluid applications, as the “best of the best”
software developed by the agency this year.
The “Science Activity Planner,” developed by a team of experts at JPL, combines
cutting-edge visualization with sophisticated planning and simula-
tion programs to provide an intuitive interface for Mars rovers and landers. It is a
multi-mission, multi-purpose tool that has achieved three successive
successes in mission operations, public outreach and technology develop-
ment.

The software comes in two versions. The first is used in mission operations and
contains the official mission activity dictionary. The second version
was released under the name “Mairetro” in the public for education and outreach.
Mairetro includes additional training features that make it a more effective
tool for public engagement.

Every day, mission scientists and engineers on the Mars Exploration Rover
mission depend on the Science Activity Planner as their primary interface to
the Spirit and Opportunity rovers. They use it to plan the next actions of the
rovers and analyze the data from the rovers. The software has been used for
more than 360 Mars days of successful mission operations of the Spirit and
Opportunity rovers without a single critical failure and still to serve this
role in the mission of the rover mission.

“We are thrilled to receive this award and honored to have been a part of
the amazing team behind the Mars Exploration Rover mission,” said Jeff
Nunes, the software team leader at JPL.

NASA also selected the Tet2US 2004 software as an award winner.
Tet2US 2004 is a suite of computer programs used for fluid dynamics and
aerodynamics analysis. Originally developed for NASA internal applications,
Tet2US 2004 has evolved into an efficient and versatile computer fluid dyn-
amics tool used by engineers and scientists throughout the nation.
The software is widely used in other government organizations, the aerospace
industry, academia and non-aerospace industries such as automotive, bio-
medical and civil engineering.

NASA began the competition in 1994, designed to reward outstanding software
at the agency, as measured by the science and technology signifi-
cance of the software and its impact on NASA missions; the extent of current
and potential use; the software’s usability, the quality factors considered in
the software: intellectual property factors such as patents and copyrights;
and innovation in software.

Software eligible for this award must have NASA intellectual property
and contain the official mission activity dictionary. The second version was
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and potential use; the software’s usability, the quality factors considered in
the software: intellectual property factors such as patents and copyrights;
and innovation in software.

Software eligible for this award must have NASA intellectual property
interest, be of commercial grade and be available to appropriate commercial
users or dedicated to a NASA mission.

For more information, visit http://ch.nasa.gov/newsnav.html.
What brings you here? What attracted you to JPL?

I have seen JPL from the vantage point of being a member of the local community and for many years have heard of its reputation as a great employer. Like ARCO, JPL is known for its community and educational outreach, and for its employee-friendly culture. I am attracted to the challenge of working in one of the world’s most prestigious scientific research and development centers.

Coming into the job, do you have any particular goals?

I come in with the belief we’re at a good starting point. JPL is a great employer; it is a great friend of the community, and it attracts world-class talent. I hope to build on that legacy in creating an environment where everyone can contribute to their fullest.

A lot of companies say that people are their greatest assets. Here, I believe it is absolutely true. Through its people, JPL has proven it can create technology that doesn’t currently exist and repeatedly conduct successful missions. Their talent will continue to create the future. But that talent is being competed for by private industry and other entities, and my goal is to have JPL continue to attract, develop and retain the best people.

We’re competing for a limited resource with industry in general, especially in the hard sciences—math and computer science. I believe there is a portion of the population that would only work in a JPL-type organization. But there are other disciplines in which we are competing head-to-head with private industry and government. It will become increasingly more important for us to develop programs and processes to attract the best talent and provide meaningful development programs to ensure we allow individuals to be fully engaged and develop to their fullest potential.

I have a passion for diversity and inclusion. I believe if employees have a high level of satisfaction with their work environment and are fully engaged and committed to the organization’s success, we will continue to attract top talent and reflect the diversity of our various recruiting sources.

What was the new Human Resources Directorate created?

There is a desire on the part of senior management to make Human Resources a more visible part of our organization. We want to better position the Human Resources function and the development of our people in a more strategic way.

The Lab has emerged from an era of fewer, long-term projects to many projects in development at the same time. That creates greater complexity and requires a more strategic look at how we deploy our human capabilities. It affects the talent pool available to project managers, as well as individuals’ own career development opportunities.

LAST MONTH, COZETTE HART JOINED JPL AS DIRECTOR FOR THE NEWLY FORMED HUMAN RESOURCES DIRECTORATE. SHE IS A MEMBER OF THE EXECUTIVE COUNCIL, REPORTING DIRECTLY TO THE LAB DIRECTOR AND DEPUTY DIRECTOR.

HART’S EXPERIENCE INCLUDES 15 YEARS WITH ATLANTIC RICHFIELD, WHERE SHE HELD A SERIES OF HUMAN RESOURCES MANAGERIAL POSITIONS OF INCREASING RESPONSIBILITY WITH ARCO CORPORATE AND SUBSIDIARY COMPANIES. ARCO WAS ACQUIRED BY BRITISH PETROLEUM IN 2000, AND WITH THAT MERGER SHE ULTIMATELY ASSUMED RESPONSIBILITY FOR LEADING THE HUMAN RESOURCES FUNCTION FOR BP’S U.S. CONVENIENCE RETAIL ORGANIZATION, ENCOMPASSING MORE THAN 19,000 EMPLOYEES ACROSS THE UNITED STATES.

PREVIOUSLY, SHE PROVIDED HUMAN RESOURCES CONSULTING SERVICES TO MORE THAN 200 HOSPITALS IN SOUTHERN CALIFORNIA FOR THE HOSPITAL COUNCIL OF SOUTHERN CALIFORNIA.

What are some of the biggest challenges in your organization?

Staffing is a critical area. We have about 1,600 transactions annually including hires, transfers and status changes. It’s a continuous challenge for us to source the talent needed for current and future projects and we need to do that in the most efficient and effective ways.

The recently launched “JPL Jobs!” online search tool is a good example of trying to make that process more accessible and easier for our employees. It is also important for us to create and leverage existing relationships with universities to underpin our efforts in campus recruiting. We want to make sure we get access to the top students and ensure we have a coordinated approach in attracting them to JPL.

The Compensation area is near and dear to all of us—for both prospective and current employees. This includes the challenge of motivating and rewarding people in the best and most appropriate ways while remaining competitive with the market.

Succession planning is another key area. We need to ensure we are developing the capabilities to meet the needs of the future—in technical skills; project proposal; development and management; and in leadership competencies.

In your career, what’s the most significant issue you have worked on or supported for the benefit of your employees?

I’m not sure I can name one significant issue. The way I approach Human Resources is to bring the components of the Employee Life Cycle (resourcing, performance management, learning and development, reward, career progression and succession planning) in cohesive support of the overall business strategy.

What are your first impressions of JPL?

First of all, I’m impressed with the open and collegial environment that exists here. While it is an explicit value, it is also apparent that it is very ingrained in the culture and is one of the contributing factors in making JPL a great place to work.

People have been very warm and multiple people have said, “Welcome to the JPL family.”

I feel I’m coming here at a great time. People are excited about what’s happening now, and about their future. I’ve met employees who have been here for many years and I’m impressed with the pride they have in contributing to the history of this place and that they continue to be excited about the contributions they are making to the science community and the world at large.
Lecturers

My family and I would like to thank all of my co-workers and friends who extended their love and support in the celebration of my 70th birthday. Your kind words, cards and flowers meant a lot to me. There is no more loving, comforting gift than time. I would also like to thank JPL and BRC for the beautiful plants. Last January, I also lost my beloved father. I fear that I may have forgotten to thank my many friends, family, and for your warm thoughts, cards, flowers and comforting words. Please accept sincere appreciation.

Sherry Chen (Susan Lee)

Thank you, JPL, for the lovely plant sent to be in honor of my mother. To my JPL friends and co-workers, thank you for the beautiful flowers, for your thoughtfulness, prayers, and for your words and cards of sympathy on the passing of my mother last month. With sincere appreciation.

Mirek Horecky

Retirees

The following JPL employees retired in May:

Sartione, D. 45 years, Section 3493; Francis
Sartione. 35 years, Section 3493; Hwang, S. 30
years, Section 3493; Chen, L. 25 years, Section
3493; Ayala, H. 25 years, Section 3493; Torres, M.
15 years, Section 3493; Navarro, J. 30 years, Sec-
tion 3493; Varghese, C. 25 years, Section 3493;
Abel, E. 25 years, Section 3493; Rios, J. 15
years, Section 3493; Miller, D. 25 years, Section
3493; Rivas, N. 30 years, Section 3493; Rosales,
J. 15 years, Section 3493; Mejia, L. 30 years, Sec-
tion 3493; Halamk, R. 30 years, Section 3493.

JPL’s Online News Sources

http://dailyplanet

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Editor
Sharon Williams

Design
David Needle, Audrey Stanford

Chief Photographer
Bob Brown/Photo Lab

Advertising
Laura Burst

Universe is published every other Friday by the Office of Communications and Edu-
cation of the Jet Propulsion Laboratory, 4000 Oak Grove Drive, Pasadena, CA 91109.

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