

UNIVERSE

Jet Propulsion Laboratory

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Twin Keck telescopes pass first test

By Jane Platt

The tired but elated summit crew at the end of the first night of observing light from the linked Keck telescopes.

From left are Gautam Vasisht, Rachel Akeson, Mark Colavita, Rick Kendrick, Gerard van Belle, Robert Ligon, Peter Wizinowich, Mark Swain and Andrew Booth.

STARS AND GALAXIES



Photo courtesy Dr. Gerard van Belle

Proving that two telescopes are better than one, a team comprised of astronomers from JPL and the California Association for Research in Astronomy have gathered the first starlight obtained by linking two Hawaiian 10-meter (33-foot) telescopes.

This successful test at the W.M. Keck Observatory on Mauna Kea makes the linked telescopes, which together are called the Keck Interferometer, the world's most powerful optical telescope system. The project will eventually search for planets around nearby stars and help NASA design future space-based missions that can search for habitable, Earth-like planets.

"Successfully combining the light from the two largest telescopes on Earth is a fabulous technical advancement for science," said Dr. Anne Kinney, director of NASA's Astronomical Search for Origins Program, which includes the Keck Interferometer project. "Using them in this way gives us the equivalent of an 85-meter (279-foot) telescope."

"This is a major step in the creation of a whole new class of astronomical telescopes that will have an enormous impact on

future knowledge," said Dr. Paul Swanson, the Keck Interferometer project manager at JPL. "Historically, breakthrough technologies like the Hale 5-meter (200-inch) and the Hubble Space telescopes have made discoveries way beyond the purpose for which they were originally built."

Monday night, March 12, starlight from HD61294, a faint star in the constellation Lynx, was captured by both Keck telescopes and transported across a sophisticated optical system across the 85 meters (275 feet) separating the two telescopes. In an underground tunnel that links the telescopes, the collected light waves were combined and processed with a beam combiner and camera. To properly phase the two telescopes, adaptive optics on both telescopes removed the distortion caused by the Earth's atmosphere. Also, the optical system in the

tunnel adjusted the light path to within a millionth of an inch.

Testing of the Keck Interferometer will continue for the next several months. Limited science operations, including the search for planets, are expected to begin this fall. Scientists around the world will soon be invited to propose studies they would like to conduct using the Keck Interferometer. Their proposals will undergo a formal review and selection process.

Since 1995, astronomers have discovered almost 50 planets orbiting other stars. With current technology, they can find very large, Jupiter-like planets, 300 times as massive as Earth, that are located close to their parent stars. Such planets are not likely to harbor life. The Keck Interferometer will be able to detect planets farther from their parent stars, which means their reflected light would be dimmer and harder to detect.

The unique pairing process will help pave the way for future interferometers in space, such as the Terrestrial Planet Finder, which will look for Earth-like planets. "This first light from the Keck Interferometer marks a dramatic step forward and will help us accomplish the ultimate goal of the Origins Program—to search for signs of life beyond by examining the light from 'Earths' orbiting nearby stars," said Dr. Charles Beichman, the Origins chief scientist at JPL.

STARS

Odyssey prepares for launch next week

Preparations continue at Kennedy Space Center for the April 7 launch of JPL's 2001 Mars Odyssey, the first launch in NASA's restructured Mars Exploration Program.

Odyssey is scheduled for launch at 8:02 a.m. PDT. It will carry a suite of scientific instruments designed to tell us what makes up the Martian surface, and provide vital information about potential radiation hazards for future human explorers.

The Odyssey team conducted vigorous reviews and incorporated "lessons learned" in the mission plan. "The team has looked at the people, processes and design to understand and reduce our mission risk," said Project Manager George Pace. "We haven't been satisfied with just fixing the problems from the previous missions. We've been trying to anticipate and prevent other things that could jeopardize the success of the mission."

Odyssey carries three scientific instruments to map the chemical and mineralogical makeup of Mars: a thermal-emission imaging system, a gamma ray spectrometer and a Martian radiation environment experiment.

The imaging system will map the planet with high-resolution thermal images and give scientists an increased level of detail to understand how the mineralogy of the planet relates to the landforms.

Odyssey's gamma ray spectrometer will allow scientists to peer into the shallow subsurface of Mars, the upper few centimeters of the crust, to measure many elements, including the amount of hydrogen that exists.

"For the first time at Mars, we will have a spacecraft that is equipped to find evidence for present near-surface water and to map mineral deposits from past water activity," said Project Scientist Dr. Steve Saunders. "Despite the wealth of information from previous missions, exactly what Mars is made of is not fully known, so this mission will give us a basic understanding about the chemistry and mineralogy of the surface."

The radiation experiment will be the first to look at Martian radiation levels as they relate to the potential hazards faced by future astronauts. The experiment will take data on the way to Mars and in orbit around the red planet.

After completing its primary mission, the Odyssey orbiter will provide a communications relay for future landers.

Lab lends a hand to kids in robotics competition

By Carolina Martinez

TECHNOLOGY

JPL engineers and support staff assisted high-school students from Southern California, Central California and Arizona during a regional robotics competition held March 15–17 at the Los Angeles Sports Arena.

Sixty-six JPLers spent numerous hours helping make the competition possible. About half of the volunteers were engineers who coached and mentored the teams from the beginning of the design

stages up to the actual competition rounds. Other JPLers volunteered to staff key positions during the three-day event as referee, judge, time clock monitor and as crowd-control monitors.

The robots took part in the For Inspiration and Recognition of Science and Tech-

nology (FIRST) Southern California regional, where 47 robots and nearly 2,000 high school students engaged in all the thrills of competition. FIRST is a non-profit organization whose mission is to generate interest in science and technology.

"This program exposes kids to careers they may not have considered before," said Rob Steele, a JPL robotics engineer and mentor to the student team at Hope Chapel Academy, Hermosa Beach. "In some respects, it's like working on a mission, where each person works on one part or component toward one common goal: mission success."

In this case, Steele said, a five-team alliance—Bellarmine College Preparatory, San Jose; Hamilton High School, Chandler, Ariz.; Hope Chapel Academy, Hermosa Beach; Mira Costa, Manhattan Beach; Redondo Union High School, Redondo Beach; and Newbridge High School, Los Angeles—took the championship at the regional and will work together in a national robotics competition at Disney's EPCOT Center in Orlando, Fla., April 5-7.

The regional was one of 13 competitions in the country, in which more than 530 teams competed.

Nationwide, NASA has awarded 100 sponsorships to high schools. Locally, JPL has awarded 24 teams with sponsorships to help competitors in the Southern California regional contest. The Laboratory is sponsoring three of those 24 teams to go to the nationals: Hope Chapel Academy—part of the championship alliance—as well as Archer School for Girls and King Drew Magnet High School of Medicine and Science, both in Los Angeles.

Results of the regional and other information about FIRST are available online at <http://www.usfirst.org>.



Bob Brown / JPL Photolab

High school students and their robots square off at the FIRST competition at the Los Angeles Sports Arena.

News Briefs



Dr. Victoria Meadows

Team chosen for astrobiology institute

JPL researchers have been chosen by NASA to be one of four new teams that will be part of the agency's Astrobiology Institute, a national and international research consortium that studies the origin, evolution, distribution and future of life on Earth and in the universe.

After a highly competitive peer-review process, teams from JPL, Michigan State University, the University of Rhode Island, and the University of Washington were selected.

DR. VICTORIA MEADOWS will lead the JPL team, which will conduct research on recognizing the biospheres of extrasolar planets. The results of her team's work are expected to directly influence the development of future space missions such as Terrestrial Planet Finder, which will look for habitable planets around other "suns."

"This work will help us determine what the signatures of life on an extra-solar planet will look like, once we have the technology to study them," Meadows said.

JPL has been active in the astrobiology field since 1997 by forming an astrobiology research element, and element lead DR. KENNETH NEALSON was a recipient of the original round of Astrobiology Institute grants in 1998 to study the co-evolution of planets and biospheres.

Children invited on Lab April 26

"You are the Future" is JPL's theme for Bring Your Child to Work Day, which

will be held on April 26. Though the national program focuses on girls, the event at JPL is open to all children between the ages of 9 and 17

Signup information can be found on the Human Resources Directorate home page at <http://hr>. Information about the national event is at <http://www.takeourdaughterstowork.org>. The deadline for submitting participation and medical release forms is April 9.

Asteroids get Irish names

JPL asteroid hunter and planetary astronomer ELEANOR HELIN has given Irish names to two asteroids in time for St. Patrick's Day, March 17.

Discovered in July 1987 by Helin, the asteroids have been officially christened by the International Astronomical Union and honor Irish contributions to astronomical research.

One asteroid is named for the Armagh Observatory in Northern Ireland, which is active in the studies of near-Earth objects. The 10,502nd asteroid found, it is called ArmaghObs. Its official designation was 1987 OT.

Another, formerly 1987 QF6, was given the ancient Gaelic name for the town of Armagh, which St Patrick founded in 445 A.D. as "Ardmacha."

Helin, the principal investigator of JPL's Near-Earth Asteroid Tracking program, has had a long association with the Armagh Observatory and she named the asteroids in part to honor that collaboration, and the observatory staff members who have made many contributions to asteroid research.

Eight JPL proposals were recently selected for funding under an Intelligent Systems NASA research announcement.

JPL received partial funding of about \$1.5 million for the first year of a three-year cycle for the eight selected and four deferred proposals. Each proposal will receive increased funding, to be determined, in fiscal years 2002 and 2003.

In the competition, six proposals by NASA's Ames Research Center were accepted, with three each awarded to Carnegie Mellon University, Pittsburgh, and the Massachusetts Institute of Technology.

The winning JPL proposals:

- **Continual Coherent Team Planning:** Many future NASA mission concepts involve teams of tightly coordinated spacecraft/rovers in dynamic, partially understood environments; this task is about developing distributed autonomy in the face of tight coordination requirements. Planning involves using high-level team goals to command a team of spacecraft/rovers that collectively manages the creation and execution of a shared team plan. Dr. Anthony Barrett is principal investigator.

- **An Onboard Scientist for Multi-Rover Science Exploration:** A unique integration of artificial intelligence planning and machine-learning techniques to autonomously provide both scientific direction and distributed control for a team of rovers. Onboard distributed data-analysis and distributed planning systems enable the team to investigate science goals with little or no ground communication. Dr. Tara Estlin is principal investigator; JPL co-investigators are Drs. Eric Mjolsness, Rebecca Castano and Ashley Davies.

- **Autonomous Vision Guided Safe and Precise Landing:** This task will develop machine vision algorithms and passive image-based control algorithms that enable safe and precise landing on hazardous terrain. The proposed algorithms will provide estimates of motion and target-relative position that will be used to guide a lander during precision landing, and will also enable hazard avoidance by providing estimates of 3-D surface topography. Dr. Larry Matthies is principal investigator; co-investigator is Andrew Johnson.

- **Using Combinatorial Optimization Algorithms to Improve Automated Planning and Scheduling:** Will develop a revolutionary automated planning and scheduling technology that can solve large, complex planning problems faster and better than—and in some cases that are infeasible—for existing planning technology. It will enable more

capable onboard planning systems, which are at the core of spacecraft autonomy. Dr. Benjamin Smith is principal investigator; JPL co-investigators are Dr. Steve Chien and Russell Knight.

- **Multi-Media Human Computer Interfaces for Mission-Critical Systems:** Objective is to expand the collaboration of cognitive and computer scientists to comprehend multimedia interfaces that also include speech and other audio data, textual information and a variety of other modes of communication. Dr. Hamid Kohen is principal investigator.

- **Intelligent Engineering Time-Series Pattern Matching:** Will develop effective search methods for large-scale time-series data, similar in spirit to an Internet search engine, but for mission sensor data (and more complex types of "keywords"). It is intended for both onboard autonomy and ground-based mission operations. Dr. Dennis DeCoste is principal investigator.

- **Autonomous Knowledge Discovery from Simulators:** Will develop data mining and knowledge discovery techniques to enable efficient, in-depth exploration and exploitation of large-scale numerical simulators emphasizing two science applications: origins of the planets/long-term behavior of solar system bodies; and magnetospheric dynamics. A unique aspect of this work is that the analysis is not confined to a static dataset; instead, the simulators can be used to generate new data leading to rich opportunities for active learning. Dr. Michael Burl is principal investigator.

- **Quantum Entanglement: Revolutionary New Algorithms for Phase Synchronization in Time and Space:** This program aims to accomplish development of quantum information theory protocols to synchronize atomic clocks nonlocally and discovery of new quantum algorithms based on distributed entanglement that enable novel sensor and quantum communication technologies. Dr. Ulvi Yurtsever is principal investigator.

Dr. Virendra Sarohia, JPL's program proposal manager for NASA research announcements, noted that more than 100 JPL concepts were evaluated internally to begin the proposal process. A JPL review board narrowed that number down to 66 proposals that were initially submitted the NASA sponsor. JPL was encouraged to submit 48 proposals for full consideration, the highest number of any NASA center.

The four deferred JPL proposals were led by Drs. Steve Chien, who had two; Terry Huntsberger and Michael Turmon.

Special Events Calendar

Ongoing Support Groups

Alcoholics Anonymous—Meetings are available. Call the Employee Assistance Program at ext. 4-3680 for time and location.

Codependents Anonymous—Meeting at noon every Wednesday. Call Occupational Health Services at ext. 4-3319.

End of Life Issues and Bereavement—Meets the second Monday of the month at noon in Building 111-117. Call the JPL Employee Assistance Program at ext. 4-3680.

Gay, Lesbian and Bisexual Support Group—Meets the first and third Fridays of the month at noon in Building 111-117. Call the Employee Assistance Program at ext. 4-3680 or Randy Herrera at ext. 3-0664.

Parent Support Group—Meets the third Thursday of the month at noon in Building 167-111. Call Greg Hickey at ext. 4-0776.

Senior Caregivers Support Group—Meets the first Tuesday of the month in Building 167-111. For information, call the Employee Assistance Program at ext. 4-3680.

Tuesday, April 3

JPL Gamers Club—Meeting at noon in Building 301-227.

JPL Genealogy Club—Meeting at noon in Building 301-271.

Wednesday, April 4

Associated Retirees of JPL/Caltech Board—Meeting at 10 a.m. at the Caltech Credit Union, 528 Foothill Blvd., La Cañada.

Music on the Mall—KTLA traffic reporter Jennifer York and her quartet will appear at noon.

Thursday, April 5

JPL Gun Club—Meeting at noon in Building 183-328.

JPL Macintosh Users' Group—Meeting at 11 a.m. in Building 180-101. An Apple Representative will give a technical demonstration of MacOS X. For more information, call Jeffery Nunes at ext. 4-8367.

Friday, April 6

All-Mozart Concert—The Caltech Chamber Singers and Chamber Orchestra will perform at 8 p.m. in the campus' Dabney Lounge. Admission is free. For information, call (626) 395-4652.

Bavaria and the Black Forest—This travel film will be shown at 8 p.m. in Caltech's Beckman Auditorium. Tickets are \$9 and \$7. For information, call (626) 395-4652.

Sunday, April 8

All-Mozart Concert—The Caltech Chamber Singers and Chamber Orchestra will perform at 3:30 p.m. in the campus' Dabney Lounge. Admission is free. For information, call (626) 395-4652.

Chamber Music—The New York Woodwind Quintet will perform at 3:30 p.m. in Caltech's Beckman Auditorium. Tickets are \$27, \$23, \$19 and \$15. For information, call (626) 395-4652.

Tuesday, April 10

JPL Stamp Club—Meeting at noon in Building 183-328.

JPL 2001 Lecture Series—Dr. Lee-Lueng Fu, Jason-1 and TOPEX/Poseidon project scientist, will present "Jason-1: Succeeding TOPEX/Poseidon in the Quest for Understanding

Ocean Climate" at 11 a.m. in von Kármán Auditorium.

Tues., April 10–Wed., April 11

Investment Advice—TIAA/CREF will hold one-on-one counseling sessions from 9 a.m. to 3 p.m. in T1720. For an appointment, call TIAA/CREF at (877) 209-3140, ext. 2614, or go to the TIAA/CREF Web site at www.tiaa-cref.org.

Wednesday, April 11

JPL Amateur Radio Club—Meeting at noon in Building 238-543.

JPL Toastmasters Club—Meeting at 5:30 p.m. in the Building 167 conference room. Guests welcome. Call Jim Raney at ext. 4-6301.

Fidelity Investment Workshop—For employees who are currently participating in their employer sponsored retirement plan and are greater than 10 years from retirement. The goal is for participants to determine whether their asset allocation is in line with their future savings needs. Attendees will be asked to consider whether they are deferring as much as they can, and shown the advantages of incremental changes in their deferral rate and asset allocation. The presentation also describes the importance of reviewing, reevaluating and rebalancing portfolios on a regular basis. To be held from 2 to 4 p.m. in the Building 167 conference room.

"Understanding the World, One Molecule at a Time"—Dr. Stephen Quake, Caltech associate professor of applied physics, will speak at 8 p.m. in Beckman Auditorium. Admission is free. For information, call (626) 395-4652.

Thursday, April 12

Microwave Theory and Techniques Society—Peter Asbeck, professor of electrical and computer engineering at UC San Diego, will discuss "Smarter Power Amplifiers for More Efficient Cell Phones" at Caltech's Moore Laboratory, room 070, 7:30 p.m., following a dinner at Avery Library 6:30 p.m. (\$10). For more information, call (800) 275-8765.

Retirement Plans—A TIAA/CREF workshop will assist newly eligible participants with investment options and in completing enrollment forms at noon in T1720-137.

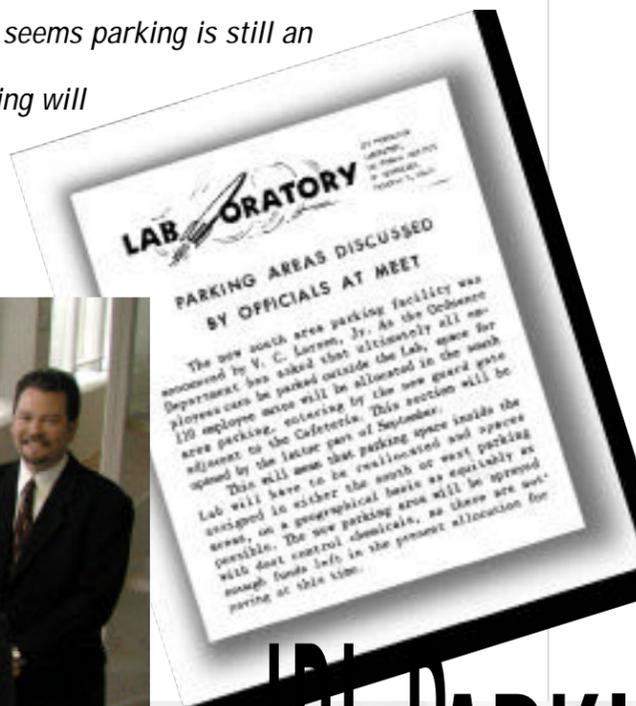
"Yuri's Night"—A celebration of the 40th anniversary of humanity's entry into space with Yuri Gagarin's historic orbit of the Earth will be held at the Hollywood Palace, 1735 Vine St., from 9 p.m. to 2 a.m. A display booth will feature JPL engineers and scientists. Tickets are \$10 if purchased before April 1, \$15 if purchased before 10 p.m. April 12, and \$20 after 10 p.m. Tickets are available through <http://la.yurisnight.net>, or Sticky Tickets at (800) 464-2275. All proceeds benefit Permission to Dream, a project hosted by the Space Frontier Foundation to give telescopes to inner-city schools and schools in Africa; and Under Africa Skies, a project to send space educators to schools in Africa.

Continuing

"QED"—Alan Alda portrays former Caltech physics professor and Nobel Prize winner Dr. Richard Feynman in a new stage presentation at the Mark Taper Forum in Los Angeles. The production runs through May 13. Regular performances are held Wednesdays through Saturdays at 8 p.m.; Saturdays and Sundays at 2:30 p.m. No performances are held Mondays or Tuesdays. Ticket prices vary. For information, call the Center Theatre Group box office at (213) 628-2772 or log on to <http://www.TaperAhmanson.com>.

Eight JPL intelligent systems proposals chosen for development

Anecdotal evidence has it that parking has been a long-standing issue at the Laboratory. This evidence is anecdotal no more; see inset of a copy of the newsletter "Lab-Oratory," which prominently features a story about parking at JPL in 1951. Fast forward to 2001, and it seems parking is still an issue, and with anticipated personnel growth, the demand for parking will exceed supply in 2003 if no actions are undertaken.



Bob Brown / JPL Photolab



JPL PARKING: ARE WE ALL SPACED OUT?

By Angela McGahan

Adding to the existing concerns over parking lot capacity recently has been the status of the leases for the East and West parking lots. JPL contracts with the City of Pasadena for the East lot in five-year increments. "Although the current contract is due to expire in June 2003, there is no reason to believe that the

lease will not be renewed at that time. JPL contracts with the Flintridge Riding Club for the West parking lot, and the lease term expired a few weeks ago. However, the Lab is currently in negotiations with the Riding Club for a subsequent lease extension," said Kirk Dawson, JPL Associate Director for Institutional issues and Chair of the Institutional Management Committee (IMC).

As part of ongoing efforts to resolve JPL's parking problems, Dawson tasked Bruce Fischer, JPL Facilities Manager, to establish a cross-organizational team to consider parking options. Individuals from all Lab Directorates—including both exempt and non-exempt personnel—comprised the Parking Study Team.

The team's goal was to identify new, creative, implementable parking options that will improve the reality as well as the perception of parking at JPL. The team met over the course of four months and grappled with such parking issues as limited supply, increasing demand, and policy guidelines.

In order to gather information and provide the JPL community a forum in which to air their parking-related issues, the team hosted a Town Hall meeting in von Kármán Auditorium in February. As a result of the meeting and written suggestions, the team reviewed, sorted and analyzed more than 350 suggestions, narrowing the options to a list of recommendations that included near- and long-term solutions; some low-cost, others expensive.

The most frequently suggested solution, and one that would go a long way to improving the parking capacity at JPL, was to build multilevel parking structures. Unfortunately, JPL cannot directly fund such a project. "Infrastructure upgrades over \$500,000 must be requested through the NASA Construction of Facilities Program. In the past, infrastructure additions such as a parking structure lost out to higher-priority upgrades required to support the program/project work at JPL. The team's work, however, identified the critical need for a parking structure," Fischer explained.

Some of the other frequently suggested solutions, such as requiring parking under all new buildings, and re-striping and reconfiguring the East and Arroyo lots, are currently being implemented. The planned Flight Project Center building (near the corner of Surveyor and Mariner roads), expected to be completed in 2004, will provide 40 to 100 new parking spaces. The Facilities Division has engaged a parking consultant that is currently in the process of evaluating the configuration of the East and Arroyo lots, and will make their recommendations shortly.

DID YOU KNOW?

- **JPL has 4,416 parking spaces—2,270 spaces on-Lab and 2,146 off-Lab (East and West lots combined).**
- **Approximately 6,000 people are on Lab at any one time.**
- **882 people arrive in either a carpool or a vanpool on an average day. The carpooling and vanpooling population provides approximately 550 parking spaces to those of us who drive. (From JPL's last Average Vehicle Ridership survey, May 2000.)**

parking spaces available, and the removal campaign will continue.

Some of the low-dollar suggestions to the Parking Study Team include promoting an increase in telecommuting, flextime, and alternative work schedules. The team also considered a recommendation that motorcycle parking rules be reviewed and that motorcycle riders be given incentives in order to generate increased motorcycle ridership, and in turn free up parking spaces for cars. Promoting the La Canada shuttle and expanding and improving the shuttle service, and turning up the volume on rideshare marketing and incentives, are other ways that would translate into more capacity by reducing demand.

On the perception side of the issue, some of the suggestions the team received were to increase parking enforcement and to address policy changes that would focus on the perceived inequities of on-Lab parking eligibility. This team was not specifically tasked to review the current status of JPL's parking policy, but recognized that policy feeds capacity. The team recommended that the IMC should establish a high-level committee with authority to change criteria for on-Lab parking eligibility.

The Parking Study Team presented its recommendations to the IMC on March 22. Although the initial period of information-collecting and analysis is over, the team's work is not finished. It is anticipated that many of the team's members will be called upon to serve on the policy review committee, and members of the team from the Facilities and Security divisions will continue to implement the identified actions.

The implementation of these actions, the feasibility of expanded telecommuting and flex-time and the willingness of the Lab community to expand the use of ridesharing (vanpooling and carpooling) should help reverse the downward trend in parking availability. The JPL community is urged to stay tuned, and stay in touch, as this is the first step into making the parking issue at JPL more anecdotal than evidentiary. You can find the latest information on the status of many of the solutions mentioned in this article by logging on to <http://jpl-facilities/665/section665.html>.

Parking study team members, from left: Helmut Partma (representing 5X), Joe Courtney (6X),

Chuck Boles (6X), Page Garcia (8X), John Miranda (6X), Lorna Deady, Section 900; Kirk Dawson (1X), Karen Phillips (2X), Bruce Fischer (6X) and Peter R. Jones (4X and 7X). Team members not pictured are Suzanne Bradfield (19X) and Carl de Silveira (3X).

Above right: Parking has been an important issue for Lab employees for a long time, as addressed by this September 1951 article in the "Lab-Oratory," Universe's predecessor.

Space Flight Awareness honorees visit KSC



Four JPL employees attended the launch of Space Shuttle Discovery earlier this month as part of the Space Flight Awareness Program. Honorees Mona Jasnow, Section 183; Todd Barber, Section 353; Cindy Jeffries, Section 910; and Laura Sergott, Section 250, toured Kennedy Space Center as part of their award.

Discovery carried the three members of the Expedition Two crew to the International Space Station; the first three astronauts to inhabit the orbiting platform returned to Earth

aboard Discovery.

The purpose of the SFA Program is to recognize and motivate employees and contractors and to increase awareness in the Space Shuttle/Space Station Program. In 1987, with growing emphasis in the payload area, several NASA centers and contractors who had not previously participated, including JPL, were invited and encouraged to join the program.

The Space Flight Awareness Program is part of JPL's Reward and Recognition Program. For more information, log on to <http://eis.jpl.nasa.gov/sec614/reward>.



From left: Honoree Laura Sergott, Section 250; honoree Mona Jasnow, Section 183; Gael Squibb, Section 900, distinguished guest; honoree Cindy Jeffries, Section 910; John Olivas, astronaut and former JPL employee; and honoree Todd Barber, Section 353.

View this and previous issues of Universe online

<http://universe.jpl.nasa.gov>

Letters

I would like to thank my friends at TAP and the Discovery Program for their compassion and support during the recent illness of my father and subsequent death. I especially thank Program Office 870, and Shari, for the beautiful floral arrangement that was sent. Your telephone calls of concern for my family were deeply appreciated and your kindness a great comfort.

Esther Cano Rodriguez and family

I would like to thank our JPL friends and colleagues for their sympathy and support following the passing of my father, Bill Fisher. Your thoughts and prayers were greatly appreciated. Our thanks also to the ERC for the beautiful plant sent in his memory.

Terry Fisher and family

On behalf of my family and myself, I would like to thank the ERC for a beautiful plant sent on my mother's passing.

Rabi Wang

I want to thank everyone who arranged my retirement party in von Kármán Auditorium and thank everyone who attended. It was a most wonderful event. I sincerely appreciate all your kind greetings and well wishes. The company, the food, and the program were fabulous. A special thanks to the "Galileo Not Ready for Real Time Players," who pretty much stole the show. The entire event was perfect. It was a great sendoff.

Bill O'Neil

Passings

MARY PHILLIPS, 72, a retired administrative secretary in Section 339, died of cancer Feb. 24.

Phillips joined the Lab in 1970 and retired in 1987. She is survived by five children, 11 grandchildren and seven great grandchildren.

Private services were held in North Carolina.

DAVID BROWNE, 90, the original editor of Universe's predecessor, "Laboratory," died March 3.

Browne worked at JPL from 1951-55. Memorial services were held March 18 in Pasadena.

WENDELL SMITH, 78, a retired offset pressman in Section 641, died of pneumonia March 16.

Smith joined JPL in 1964 and retired in 1985. He is survived by his wife, Nancy, children Robin and Wendell Jr., and five grandchildren.

Services were private.

Classifieds

For Sale

AIRLINE TICKET, round-trip, anywhere Southwest flies, travel must be completed by May 18, \$300/obo. 626/355-3886, Rosemary or Katherine.

BBO, Sunbeam gas grill, wooden shelves on both sides for food, utensils and plates, cover included, \$50. 714/903-8888.

BED, twin, white arched metal headbd. & footbd., exc. cond., \$90/obo. 310/670-6830.

BIKE, 20-year-old men's Nashbar, Sport Ex road bicycle, 18 speed, 60 cm frame, good tires, make offer. 626/355-5405.

CELL PHONE ACCESSORIES, Nokia, 6100 series, hands-free kit and car charger, paid \$50, sell for \$20/obo. 714/903-8888.

COFFEE, Kona, top of the line 100% pure & sun dried, hand picked from top qual. trees, rich, dark roast, ltd. supply, disc. 45% at introductory price of \$21/lb. 626/584-9632.

DESK/CHAIR, antique mahogany, roll top, \$1,500; **TABLES**, 2 custom rod iron indoor/outdoor, w/heavy glass top, \$2,500. 248-8853.

DESK, roll-top, maple, exc. condition, \$500. 249-0283.

FURNITURE: bed, Ethan Allen, queen size maple poster bed, \$350; table, maple, Ethan Allen, 48" round, plus center leaf and 4 matching captain's chairs, \$300; sofa/sleeper, new, queen, loose pillow, muted tan/purple/blue plaid, \$450. 626/355-0989.

FURNITURE: brand new La-Z-Boy sofa, love seat & rocker, paid \$1,880, will take \$1,500 firm. 541-0131, Gary or Sue.

GRAVE SITES, 4 adjacent plots in Rose Hills Memorial Park, Cypress Lawn section, lot 2842, plots 1, 2, 3 & 4, all for \$2,500. 805/739-9204, day or eve.

LAMPS, 3 unique wagon wheel hubs, 2 are old & weathered, 1 is hand carved, all are 13-14" tall, sitting on one end the light comes through spokes slats, \$5 ea./obo. 909/593-4046 or vividavies@starquest.net.

MICROWAVE, \$25/obo; **TOASTER**, \$10/obo; **FERN**, outdoor, hanging, \$10. 626/449-3699.

MISC: sectional couch, beige, almost new, \$300; coffee table, \$75; 4 stacked tables, \$200; bar cart, \$150; child's bike, toys, etc., best offer. 248-8853.

MOVING SALE: chest freezer, 15 cu. ft., Kenmore, \$125; couch/futon, 52" w x 6' l, \$50; bunk beds & mattresses, \$100; oak table, 42" w x 5' l & two 17" leaves, w/6 chairs, \$700; wood desk w/return, \$100; oak ent. ctr. w/cut glass door, 5' w x 55" tall, \$300; oak ent. ctr., 5' w x 6' tall, \$250; photos at <http://www.gg.caltech.edu/~rjacobs/overtheedge/furn01.html>. 626/574-0480.

ORGAN, Conn Theatre 551, type 3, electric, 2 keyboards, foot pedals & cassette recorder, \$300. 249-0283.

PIANO, Chickering Grand, mfg. in 1923, gd. cond., beautiful presentation, located at Pasadena-area residence, photo at <http://jaw.deepspace.com/piano.html>, \$3,200/obo. 661/251-6916.

PLANTS: variegated Ficus Benjamin, 4 ft. tall, \$25/obo; Kentia Palm, 3 feet tall, very graceful, \$35/obo. 626/449-3699.

PRINTER, color inkjet, Compaq IJ1200, brand new, box unopened, 2400 x 1200 res., \$100 (\$40 less than retail). 353-4400, Brian.

REFRIGERATOR, 17 cu. ft., frost-free, almond, exc. cond., \$85. 626/744-2714, eve.

SCANNER, brand new, never used, still in box, Visioneer 3300, 1600 x 200 dpi, optical resolution, 36-bit color, Win 95/98, Win NT4.0/2000, \$80. 626/304-0794, Patty.

SEWING MACHINE, Pfaff Creative 1471 with accessories and instruction manuals, electronic machine with dual feed mechanism, great for quilters, Blue Book price \$474, sell for \$425/obo. 792-8685, eve.

STOVE, vintage 1940s, cobalt blue, fully restored, new wiring/paint/insulation; has built-in salt & pepper shakers, perfect cond., \$3,000. 626/287-9433.

SWING SET and play structure, includes 2 swings, rocket-rider, hoops, monkey bars, climbing rope, slide, playhouse and upper-deck w/ladder, all redwood construction with galvanized lag-bolts for durability and easy assembly, very good cond., orig. price over \$1,000, sell \$350. 626/303-3719, evenings.

TABLE, dinette, sq. glass top 5' x 5' w/metal feet and 4 matching chairs, \$800/obo; **BAR STOOLS**, 4 matching, metal frame, all in superb cond., \$400/obo. 626/398-3480.

Vehicles/Accessories

'92 ACURA Legend LS, auto transmission, all options, beige/gold, 84K miles, always garaged, exc. cond., all service records available, new timing belt and new brakes, \$10,800. 236-4869, after 5 p.m., Harold.

'89 CHEVROLET S10 Blazer, V6, auto, 2x2, a/c, pwr. wndws./dr. locks, am/fm/cass., cruise ctrl., tilt whl., tinted wndws., tow pkg., lug rack, full-size spare, 128K mi., well-maint., \$3,800. 626/794-1716.

'86 CHEVROLET S10 Blazer, 4x4, 128,000 mi., 1 owner, a/c, pwr windows/locks/steering, trailing hookup, roof rack, tilt steering, cruise cont., runs gd, everything working, gd tires, passed last emission test. \$3,200. 661/513-9079.

'94 DODGE Intrepid sedan, 4 dr., blue, 58K miles, a/c, cruise control, power steering, windows, door locks, new tires, exc. cond., \$5,000/obo. 500-0330.

'92 DODGE Shadow, automatic, white, 114K miles, a/c, good cond. \$3,000. 626/398-7573.

'91 DODGE Grand Caravan, white, 117K miles, 7 passenger, cruise cont., power steering, windows, door locks, tow package, new tires, well maintained, \$3,000/obo. 500-0330.

'97 FORD Escort LX, auto, air, exc. cond., 76K miles, \$5,500/obo. 626/351-9880, eves. and weekends.

'96 FORD SVT Cobra Mustang conv., 5 speed, all black, leather interior, stereo w/CD changer, security alarm w/LoJack, clean, well maintained, exc. cond., no modifications to body or engine, garage-kept w/cover, less than 27K miles, \$21,000/obo. 626/379-1540.

'91 HONDA Civic LX, 165K miles, 4 door, automatic, a/c, power windows/doors, am/fm/cass., well-maintained, exc. transportation, \$3,800. 626/332-1597, after 5 p.m.

'96 JEEP Grand Cherokee LTD, V8, 4 w/d, always garaged, exc. cond., \$17,400. 957-5382.

'91 LEXUS LS 400, 122K mi., \$11,000. 790-0697.

'94 MAZDA 626 ES sedan 4 dr., V6, silver w/gray lthr int., auto, a/c, pwr. s/w/d/l, cc, am/fm stereo/cass., ABS, moonrft, alloy whls., exc. cond., all maint. records, \$4,950. 830-8993, eve. & wkend. or 903-8979, cell.

'90 MAZDA Miata, convertible, red, 5 speed, with roll bar and 6 spk. audio system, 100K mi., \$3,500 obo. 626/798-1990, Bob.

'91 MERCURY Tracer Wagon, red, auto, a/c, roof rack, am/fm/cassette, exc. cond., 90,000 miles, 30 mpg+, \$4,000 firm. 626/458-7794.

'92 PONTIAC TransSport SE van, red/black, 109K mi., 6 seats, engine has just 29K mi., good cond., \$4,000. 249-6543, after 5 p.m.

'80 PONTIAC Grand Prix, runs well, auto, new battery, 100K+ mi., needs some work, \$1,250/obo. 626/398-6564.

'95 SATURN SL sedan, 5 speed, white exterior, gray interior, a/c, 74,000 miles, exc. running cond., good physical condition, 27 city & 37 freeway mpg, am/fm/tape, no accidents, \$4,900/obo. 957-5742.

'93 SUBARU Impreza L, hatchback, automatic, p/w, p/m, CD, cassette, 5 dr., good cond., no mechanical problems, 137K mi., \$3,400/obo. 626/222-1725.

'89 TOYOTA Supra, turbo, V6, 5 speed, 120K mi., new clutch/brakes, sport roof, ac, ps, pw, pdl, alarm, tilt wheel, cruise, am/fm/cd, ABS, good condition, \$4,400/obo. 626/449-2007.

'95 VOLVO 850 GLT wagon, 5 speed, good cond., 102K mi., green/beige, leather interior, theft deterrent, sunroof, winter pkg., child booster seat, AM/FM/tape/6 CD changer, \$12,500. 952-9463, evenings.

Wanted

BABYSITTER, part time, for a toddler (boy, 2.5) in Altadena; mother with child OK. 626/791-0585, evenings, Ulvi or Aysa.

HOUSING: returning graduate researcher couple, non-smokers, seek 1 bd. from end of May to end of Dec., must allow pets. 720/890-1310 or 303/492-8274, jahm@mail1.jpl.nasa.gov.

HOUSING: the Educational Affairs Office seeks help in locating furnished apartments, houses or rooms for students in the Summer Intern Program to rent for about 2 mo. Ext. 4-1444, Lisa Campbell.

TO RENT, Australian professor visiting JPL seeks rental accommodation for self and family in La Canada school district, Aug. 2001 to Feb. 2002. 952-1456.

VOLLEYBALL PLAYERS, coed, all levels of play, Tuesday nts. 8-10 at Eagle Rock High School, \$3/night. 956-1744, Barbara.

Free

BAND SAW and radial arm saw, worn but working. 626/797-5804, leave message.

CATS, 2 kittens found at service station, brother (long-hair beige Tabby, a little shy) and sister (short hair calico, very friendly); received 1st set of shots, both spayed/neutered, litter trained. 626/287-9433.

CATS, several wonderful middle-aged kitties need new homes because owner recently passed away. 626/791-3763, Judy.

DOG, 2-year-old, male German Shepherd; neutered, has all shots. 626/287-9433.

DOG, to good home, pretty Lab/Aussie mix, neutered male, black/chocolate w/med./long hair, 1 year old, 55 lbs., gd. with kids, professionally trained; playful but not overactive, very loving, likes other dogs but the older dog at home can't adjust to him. 661/298-2680.

DOG, 1-year-old "Woody" grew up w/children and toddlers, kind personality, loves to play, Huskie/Shepherd mix, all shots, black w/white tummy & paws, we've got to move and aren't allowed to take him. 626/446-4672, lv. msg.

Lost & Found

Lost: Wedding band, slightly bent; very high sentimental value; possibly lost in vicinity of Bldg. 183. Matt at 4-2259 or e-mail mtuch@jpl.nasa.gov.

For Rent

ALTADENA 2 bd., 1 ba + 2-car garage and fireplace, immaculate condition, approx. 4 miles from JPL. 626/797-9546.

LA CANADA, room in lovely priv. home, priv. bath, gar., kitch. privileges, \$450. 952-3382.

LA CANADA/FLINTRIDGE, rm, kitch. privi-leges, BBO, pool, off-st. parking. 790-1280.

LA CRESCENTA, cozy 2-bd. house w/pool, private, high above Foothill, \$1,450. 952-6007.

MONROVIA, lg. rm. in house, private ba., full privileges including pool, 12 miles from JPL, no pets, \$475. 626/358-7728, after 7 p.m.

PASADENA house, 1-yr. lease beginning June '01, fully furn., 2 bd., 1 ba., 2 miles/Caltech, charming, comfortable, fireplace, hardwood floors, fruit trees, located in historic bungalow neighborhood, \$1,300. 626/797-7407 before 9 p.m. or cobb_salad@hotmail.com.

PASADENA, awesome 2-bd., 2.5-ba., 3-story townhouse to share w/fun-loving, considerate, responsible non-smoker; must see; priv. floor w/bdrm. and bathrm., spacious 2-car gar., washer/dryer, cent. air/heat, skylights, fireplace, balcony, huge kitch. w/dishwasher, new carpets, great n'borhd; \$650+ deposit +1/2 util.; 64 N. Oak. 626/229-5240, Lavonne.

SOUTH PASADENA apt. to share, 2 bd., 1.5 ba., secure parking, large bd., near Fair Oaks and 110, \$500. 626/799-5512, Mr. Monico.

Real Estate

ALTADENA, "Meadows," min. from JPL, mtn., cyn. and city views, 1,350 s.f., roomy & spacious, 2 bd., 1 ba., 10,460 s.f. lot, new hardwood floors, carpet, open house Sundays, call for times, a must see, 4118 Canyon Crest Rd. 626/797-7893.

LA CANADA/FLINTRIDGE, hilltop home above Flintridge Sacred Heart Academy, modern house designed by Millard Sheets, spectacular views thru floor to ceiling glass windows, on .5 acre lot, 4 bd., 2,300 sq. ft. + 900 sq. ft. covered decks and patios, La Canada schools, for sale by owner, \$790,000. 790-4981.

SUNLAND/TUJUNGA, why pay twice the price for half the house? 15 easy minutes to JPL, never any smog, seldom even fog at the 1,650 foot elevation of this 3 bd., 2 ba., 2,900 sq. ft. home with loads of extras on a 10,000 square foot level lot, \$349,000. <http://www.its.caltech.edu/~sharonb/> or 352-7321.

Vacation Rentals

BIG BEAR cabin, quiet area near village, 2 bd., sleeps 8, completely furnished, f/p TV/VCR, \$75/night. 249-8515.

BIG BEAR LAKEFRONT lux. townhome, 2 decks, tennis, pool/spa, nr. skiing, beaut. master bdrm. suite, sleeps 6. 949/786-6548.

CAMBRIA, ocean front house, sleeps up to 4, excellent view. 248-8853.

HAWAII, Kona, on 166 feet of ocean front on Keauhou Bay, priv. house & guest house comfortably sleeps 6; 3 bd., 2 ba., rustic, relaxing and beautiful, swimming, snorkeling, fishing, spectacular views, near restaurants, golf courses & other attractions. 626/584-9632.

HAWAII, Maui condo, NW coast on beach, w/ocean view, 25 ft. fr. surf, 1 bd. w/loft, compl. furn., phone, color TV, VCR, mcrow., d/w, pool, priv. lanai, slps. 4, 4/15-12/14 \$105/nt./2, 12/15-4/14 \$120/nt./2, \$10/nt. ad-d'l person. 949/348-8047.

MAMMOTH, Chamonix condo, at lifts 7, 8, 16, 17, walk to Warning Hut, 2 bd., 2 full ba., sleeps 6, fully equipped elec. kitch., incl. microwave & extras, f/p & wood, color TV/VCR, cable, FM stereo, o/d Jacz., sauna, game, rec & Indry rms, conv. to lifts, shops, special events, spec. midwk rates. 249-8524.

MAMMOTH, Courchevel, walking distance to Canyon Lodge and lifts, 2 bd., 2 ba., sleeps 6, fully equipped unit. 661/255-7958.

MAMMOTH, Snowcreek, 2 bd., 2 ba., + loft, sleeps 6-8, fully equipped kitchen incl. microwave, d/w, cable TV, VCR, phone, balcony w/view to mtns., Jacz, sauna, streams, fishponds, close to Mammoth Creek, JPL discount. 626/798-9222 or 626/794-0455.

OCEANSIDE, on the sand, charming 1-bd. condo, panoramic view, walk to pier or harbor, pool, spa, game rm., sleeps 4. 949/786-6548.

OCEANSIDE condo, fully furn. 2 bd., 2 ba., f/p, full kitch., quiet, relaxing, beautiful setting, located at beachside, BBO, pool, spa, game rm, great ocean view, easy walk to pier and restaur., slps. 6, 2-nt. min., avai. weekly or monthly. 909/981-7492, Jim or Darlene.

ROSARITO BEACH condo, 2 bd., 2 ba., ocean view, pool, tennis, short walk to beach on priv. rd., 18-hole golf course 6 mi. away, priv. secure parking. 626/794-3906.

SAN CLEMENTE COVE timeshare, half-block to beach & pier, sleeps 4, one wk from 4/1 or 5/13, \$475. 626/836-3931.

SAN FRAN., Nob Hill honeymoon suite, slps 2 max, full kitch., maid svcs., concierge, reserve early, \$125/nite, \$750/wk. 626/254-1550.

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Advertising is available for JPL and Caltech employees, contractors and retirees and their families. No more than two ads of up to 60 words each will be published for each advertiser. Items may be combined within one submission.

Ads must be submitted on ad cards, available at the ERC and the Universe office, Bldg. 186-118, or via e-mail to universe@jpl.nasa.gov.

Ads are due at 2 p.m. on the Monday after publication for the following issue.

All housing and vehicle advertisements require that the qualifying person(s) placing the ad be listed as an owner on the ownership documents.