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salute JPL, Mars	

## Review board reveals findings on Climate Orbiter

Focus is on recommendations for successful Dec. 3 landing

**W**ide-ranging managerial and technical actions are underway at JPL in response to the loss of the Mars Climate Orbiter and the initial findings of NASA's mission failure investigation board, whose first report was released Nov. 10.

Focused on the upcoming landing of the Mars Polar Lander on Dec. 3, JPL's actions include: a newly assigned senior management leader, freshly reviewed and augmented work plans, detailed fault tree analyses for pending mission events, daily teleconferences to evaluate technical progress and plans work yet to be done, increased availability of the Deep Space Network for communications with the spacecraft, and independent peer review of all operational and contingency procedures.

"The board recognizes that mistakes occur on spacecraft projects," the NASA report said. "However, sufficient processes are usually in place on projects to catch these mistakes before they become critical to mission success. Unfortunately for Climate Orbiter, the root cause was not caught by the processes in place in the Climate Orbiter project."

"We have mobilized the very best talent at JPL to respond thoroughly to the specific recommendations in the board's report and the other areas of concern highlighted by the board," said JPL Director Dr. Edward Stone. Tom Gavin has been temporarily reassigned as full-time program manager for Mars Polar Lander. Other temporary senior management assignments for Polar Lander are Dr. Richard Zurek, project scientist; Richard Cook, project manager; and Matt Landano, deputy project manager.

"Special attention is being directed at navigation and propulsion issues, and a fully independent 'red team' will review and approve the closure of all subsequent actions," Stone added. "We are committed to doing whatever it takes to maximize the prospects for a successful landing on Mars on Dec. 3."

To that end, Stone pledged that JPL will take actions on several fronts:

- Navigation: direct interaction will take place between the spacecraft team and collocated navigation team member; additional navigation techniques will be employed; and trajectory correction maneuver no. 5 will be baselined.
- Systems engineering: a chief systems engineer has been assigned for Polar Lander; a formalized operational requirements verification matrix has been formed, as has a comprehensive fault tree of entry, descent and landing.
- Engineering: significantly increased temperature margin of the propulsion system during descent and landing, and a reverified propulsion system operation.
- Peer review: 30 JPL principal engineers will provide an intensive review of Polar Lander's entry, descent and landing; six senior Lab navigators will comprise an advisory group and peer review team; an independent "red team" will be required to close out all work



Photo by Bob Brown / JPL Photo

JPLers watch Nov. 10 briefing on the findings and recommendations of the NASA Mars Climate Orbiter investigation board.

plan items; and the size of the Polar Lander review board has been doubled.

- Mission safety: a senior mission assurance manager has been assigned; all prior risk assessments and software and interfaces are being revalidated.

The NASA board's report identifies eight contributing factors that led directly or indirectly to the loss of the orbiter. These contributing causes include inadequate consideration of the entire mission and its post-launch operation as a total system, inconsistent communications and training within the project, and lack of complete end-to-end verification of navigation software and related computer models.

"The 'root cause' of the loss of the spacecraft was the failed translation of English units into metric units in a segment of ground-based, navigation-related mission software, as NASA has previously announced," said Arthur Stephenson, chairman of the Mars Climate Orbiter Mission Failure Investigation Board and director of NASA's Marshall Space Flight Center, Huntsville, Ala. "The failure review board has identified other significant factors that allowed this error to be born, and then let it linger and propagate to the point where it resulted in a major error in our understanding of the spacecraft's path as it approached Mars," Stephenson added.

At a Nov. 10 briefing on the board's findings, Dr. Ed Weiler, NASA's associate administrator for space science, was asked if anyone at JPL should lose their job over the loss of the mission. "Who would I replace them with?," Weiler replied. "These are the best people in the world. Nobody does it better than JPL; they've done it for 40 years, and they've done the impossible. Mars Pathfinder was a 'faster, better, cheaper' mission, and it was 10 times cheaper than Viking. But the whole philosophy of 'faster, better, cheaper' includes following the rules and processes in place."

The board's report is available online at [ftp://ftp.hq.nasa.gov/pub/pao/reports/1999/MCO\\_report.pdf](ftp://ftp.hq.nasa.gov/pub/pao/reports/1999/MCO_report.pdf). Stone's presentation at the Nov. 10 briefing is available at [ftp://ftp.hq.nasa.gov/pub/pao/reports/1999/MCO\\_charts.pdf](ftp://ftp.hq.nasa.gov/pub/pao/reports/1999/MCO_charts.pdf).

## 4-day, 40-hour workweek encouraged

The flurry of activity that will envelop JPL during the week following Thanksgiving has prompted the Executive Council to approve an alternative 4/40 workweek for the week beginning Nov. 29.

With Mars Polar Lander scheduled to arrive at the red planet on Friday, Dec. 3, more than 2,000 officials and media personnel from around the world will witness the event at the Laboratory. To alleviate congestion and

accommodate numerous visitors, vehicles and equipment, employees are encouraged to participate in this special schedule, but it is voluntary. If child care or other circumstances make it difficult to alter your schedule, let your supervisor know that you will need to work the regular, five-day schedule.

Employees who work 10 hours per day for four days (Monday, Nov. 29 through Thursday,

Dec. 2) to meet their scheduled hours will not be required to report to work on Dec. 3. The Acquisition Division is requesting that contracting companies follow the 4/40 work schedule for that week also.

Supervisors and managers should give early notification to employees who will be required to work on Dec. 3. The west and blue parking lots will be designated for visitors only on that day. Employees who work should

park in the east lot. Employees may also be directed to other local-area parking as directed by Security. Questions regarding parking may be directed to Chuck Boles at ext. 4-4586.

All three cafeterias will be open on Dec. 3; however, limited menu selections and seating will be available in the 167 cafeteria due to guest operations. For questions on the alternative work schedule, call Tania Geddes on ext. 4-9748.

# News Briefs



Dr. Susan Kurtik

### Public Affairs reorganizes

In an effort to improve JPL's overall communications efforts, the Public Affairs Office, Division 180, has been reorganized and renamed.

The new Office of Communications and Education, managed by BLAINE BAGGETT, now includes the Educational Affairs Office (185) and the newly formed Outreach Office (183). DR. WILLIAM WHITNEY is acting manager of the Educational Affairs Office and MARK PINE is acting manager of the Outreach Office. Full-time outreach personnel from Lab projects will transfer into the new Outreach Office. Remaining intact in Division 180 are the Media Relations Office (181), Audiovisual Services Office (182) and Public Services Office (184).

The reorganization also includes the formation of five integrated, thematic communications teams which will each include staff from education, media relations, outreach, science/technical, video, and Internet services.

After an extensive competition, the following individuals were selected as team leads for each theme area: Earth, MARGUERITE SYVERTSON; Mars, DAVID SEIDEL; Solar System, KIM SHEPARD and ANITA SOHUS; Technology, ALICE WESSEN, and Universe, MICHELLE VIOTTI. The teams will coordinate and integrate communications planning and activities for JPL missions and programs, working closely with each other and the program and project managers.

### Kurtik wins Women at Work medal

DR. SUSAN KURTIK, manager of the Telecommunications and Mission Operations Directorate's Telecommunications Services Office, has been named the winner of the 1999 Medal of Excellence Award by Women At Work, a non-profit career and job resource center based in Pasadena.

Kurtik, with JPL since 1989, was nominated for the award by JPL's Advisory Council for Women based on her leadership and team building skills, as well as her ability to motivate and challenge those around her.

Kurtik, who holds a doctorate in electrical and computer engineering

from the University of California, Santa Barbara, has won NASA Group Achievement Awards, Certificates of Technical Recognition, and a NASA Exceptional Service Medal.

### Blood drive coming up

The next JPL/Red Cross Blood Drive will be held in von Kármán Auditorium Nov. 16 from 10 a.m. to 4 p.m. and Nov. 17 from 7 a.m. to 1 p.m.

Sign-up sheets are available at Occupational Health Services, Building 310-202, prior to the blood drive. For last-minute signups or to change an appointment, call the Red Cross at (626)799-0841 ext. 630, or e-mail them at [sinovec@sgvarc.org](mailto:sinovec@sgvarc.org).

### King celebration leaders named

The Advisory Committee on Minority Affairs has named HAMILTON HILL of Section 336 as the chair of JPL's 2000 Dr. Martin Luther King Jr. Celebration, which is scheduled for Jan. 21. DEBI WADE of Section 345 was named the event's co-chair.

For information, contact Hill at ext. 4-9874.

### Heritage Week leads needed

The Advisory Committee on Minority Affairs announces a call for a chair, co-chair, and sub-committee leads and members for the 2000 American Heritage Week celebration. The event is scheduled for June 12-15.

If interested, contact DORA MONTANO at ext. 4-2752 or NERISSA PARMELEE at ext. 4-6352.

### Huntress to receive honors

Former JPL scientist and NASA associate administrator for space science DR. WESLEY HUNTRESS will receive the Caltech Management Association's 1999 Excellence in Management Award at a Nov. 29 dinner at Caltech's Athenaeum.

Tickets for the event are \$34 for CMA members and guests, \$44 for new or renewing members. Reservations are due Nov. 22; call ALICE TANGNEY at ext. 4-4894.

Huntress is now the director of the Geophysical Laboratory at the Carnegie Institution of Washington.

## Rose Parade float to salute JPL, Mars

By Betty Shultz

On the morning of Jan. 1, 2000, viewers of Pasadena's Tournament of Roses Parade will see a float that salutes the early accomplishments of the U.S. space program, as well as present and future missions to Mars.

"Celebration 2000: Visions of the Future" is the theme of next year's parade, and Edison International—in cooperation with NASA, JPL and Caltech—has designed their float entry "Soaring to the Future" as a tribute to space exploration and humankind's quest for knowledge of the universe.

Conceived by renowned float designer Raul Rodriguez and built by the award-winning Fiesta Parade Floats in Duarte, the float is dominated by an eagle—a symbol of power and excellence—and a large red planet, symbolizing Mars. Elaborate floralgraphs along both sides of the float will portray images of space exploration.

Edison International's float will be the only all-electric vehicle in the parade, promoting clean energy by using solar charged batteries as its energy source.

JPL Director Dr. Edward Stone will ride on the float along with surprise guests including astronauts, students and educators.

There are several opportunities

for JPLers and their families to participate in the festivities and decoration of the float. On Saturday, Dec. 4, employees, contractors and their children are invited to "Kids Day" at Fiesta Parade Floats at Buena Vista Street and Duarte Road in Duarte. Decorating workshops will show kids some of the basics of float decorating; light refreshments and lunch will be served free of charge. In addition, choral groups will perform, the local fire department will be there, Santa Claus will visit, and JPL exhibits and displays will be featured.

Saturday, Dec. 18 has been designated as JPL Day. Edison invites employees and their families to assist decorating the float. Lunch and snacks will be provided to the volunteers.

In order to plan for enough food and beverages, Edison has asked that volunteers sign up in advance. Sign-up forms are available at the ERC.

For additional information, call ERC at ext. 4-6120.



JPLers can help decorate the float on Dec. 18

# Special Events Calendar

### Ongoing

**Alcoholics Anonymous**—Meeting at 11:30 a.m. Mondays, Tuesdays, Thursdays (women only) and Fridays. Call Occupational Health Services at ext. 4-3319.

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

**Gay, Lesbian and Bisexual Support Group**—Meets the first and third Fridays of the month at noon in Building 111-117. Call employee assistance counselor Cynthia Cooper at ext. 4-3680 or Randy Herrera at ext. 3-0664.

**Parent Support Group**—Meets the fourth Tuesday of the month at noon. For location, call Jayne Dutra at ext. 4-6948.

**Senior Caregivers Support Group**—Meets the second and fourth Wednesdays of the month at 6:30 p.m. at the Senior Care Network, 837 S. Fair Oaks Ave., Pasadena, conference room #1. Call (626) 397-3110.

### Fri., Nov. 12—Sun., Nov. 14

**"Hedda Gabler"**—The Ibsen play will be presented by Theater Arts at Caltech Friday and Saturday at 7:30 p.m., Sunday at 3 p.m. at Dabney Lounge. Admission is to be determined. Call (626) 395-4652.

### Saturday, November 13

**Folk Music**—Guitarist Chris Proctor will perform at 8 p.m. in Caltech's Winnett Center Lounge. Tickets are \$12 for adults, \$4 for children under 12. Call (626) 395-4652.

### Sunday, November 14

**Chamber Music**—The New York Chamber Soloists will perform at 3:30 p.m. in Caltech's Beckman Auditorium. Tickets are \$25, \$21, \$17 and \$13. Call (626) 395-4652.

### Monday, November 15

**Caltech Ballroom Dance Club**—Beginning American waltz will be held from 7:30 to 9 p.m. in Caltech's Winnett Lounge. Cost: \$24. See [www.caltech.edu/~ballroom](http://www.caltech.edu/~ballroom) or call 626/791-3103.

**Director's Topical Seminar Series**—JPL Distinguished Visiting Scientist Dr. Freeman Dyson will present "Life in the Universe: Is life Digital or Analog?" at 11:30 a.m. in von Kármán Auditorium.

### Wednesday, November 17

**AFS Quick Start Session**—Jeff Sachs of Section 366 will provide Windows NT users with an overview of the benefits of this distributed file system to manage computer files, change passwords and protect data. At noon in the Building 167 conference room.

**Caltech Ballroom Dance Club**—Beginning rumba will be held from 7:30 to 9 p.m. in Caltech's Winnett Lounge. Student taught; cost: \$1. See [www.caltech.edu/~ballroom](http://www.caltech.edu/~ballroom) or call 626/791-3103.

**JPL Drama Club**—Meeting at noon in Building 301-127.

**JPL Hiking Club**—Meeting at noon in Building 238-543.

### Thursday, November 18

**JPL Golf Club**—Meeting at noon in Building 306-302.

**Caltech Architectural Tour**—The Caltech Women's Club presents this free service, which is open to the public. The tour begins at 11 a.m. and lasts about 1 1/2 hours. Meet at the Athenaeum front hall, 551 S.Hill, Pasadena. Call Susan Lee at (626) 395-6327.

**JPL Employee Appreciation Night**—Show your JPL badge from 4 to 10 p.m. to receive a 25% discount on books, music, videos and more at Borders Books, Music & Cafe, 475 S. Lake Ave. in Pasadena, RSVP by e-mail to [csiler@bordersstores.com](mailto:csiler@bordersstores.com); in the subject line type "JPL Event" and the number in your party.

**SESPD Lecture**—Guest speaker Robert Faquhar will present "Deep-Space Missions at the Applied Physics Laboratory" at 11 a.m. in von Kármán Auditorium.

**Von Kármán Lecture Series**—Elizabeth Duxbury, Steve Hughes, Myche McAuley and Rob Toaz will describe the Planetary Photojournal, Planetary Image Atlas and other image resources when they present "Public Access to Mission Data" at 7 p.m. in von Kármán Auditorium. Open to the public.

**"Y2K Problem: Solved?"**—Dr. Robert Neary, chief administrative information officer at Caltech, will speak at 8 p.m. in Beckman Auditorium. Free admission. Call (626) 395-4652.

### Friday, November 19

**Caltech-Occidental Concert Band**—"Music for Winds: 1900-2000" will be presented at 8 p.m. in Caltech's Beckman Auditorium. Free admission. Call (626) 395-4652.

**JPL Dance Club**—Meeting at noon in Building 300-217.

**Von Kármán Lecture Series**—Elizabeth Duxbury, Steve Hughes, Myche McAuley and Rob Toaz will describe the Planetary Photojournal, Planetary Image Atlas and other image resources when they present "Public Access to Mission Data" at 7 p.m. in The Forum at Pasadena City College, 1570 E. Colorado Blvd. Open to the public.

### Sunday, November 21

**"Heaven: The Search for a Higher Plane from Dante to Cyberspace"**—The Skeptics Society will present this lecture at 2 p.m. in Caltech's Baxter Lecture Hall. Donation: \$5 for members, \$8 nonmembers. Call (626) 395-4652.

### Monday, November 22

**Caltech Ballroom Dance Club**—Beginning American waltz will be held from 7:30 to 9 p.m. in Caltech's Winnett Lounge. Cost: \$24. See [www.caltech.edu/~ballroom](http://www.caltech.edu/~ballroom) or call 626/791-3103.

**Caltech-Occidental Symphony Orchestra**—The program for this free performance is to be determined. Held at 8 p.m. in Caltech's Ramo Auditorium. Call (626) 395-4652.

### Wednesday, November 24

**Caltech Ballroom Dance Club**—Beginning rumba will be held from 7:30 to 9 p.m. in Caltech's Winnett Lounge. Student taught; cost: \$1. See [www.caltech.edu/~ballroom](http://www.caltech.edu/~ballroom) or call 626/791-3103.

**JPL Drama Club**—Meeting at noon in Building 301-127.

**JPL Toastmasters Club**—Meeting at 5:30 p.m. in the Building 167 conference room. Guests welcome. Call Mary Sue O'Brien at ext. 4-5090.

*JPL Director Dr. Edward Stone addressed Laboratory staff in a town hall meeting on Nov. 11, one day following a briefing on the findings of the Mars Climate Orbiter investigation board. Following is the text of his remarks.*

# YESTERDAY, TODAY AND TOMORROW



Photo by Bob Brown / JPL Photo

Good morning. Thank you for coming. I want to talk to you about yesterday, today, and tomorrow. And I'll begin with yesterday.

Without question, yesterday was the hardest day I've experienced in all my years at JPL. It was hard because of an old truth. It goes something like this: the higher the expectation, the greater the impact of failure.

At JPL there are the highest of expectations for success. The world expects that of us. And we expect it of ourselves. It's part of our culture to accept nothing less than the best—and to have no expectation but to succeed. That's why failure is so difficult for us to accept. I know that you must be experiencing these feelings, because I certainly am. If yesterday was hard for me, I know that today is hard for you.

Let's talk about today. There are a number of pressing issues which we must take on and master quickly. And I'd like to share some of them with you.

#### Open communications

Our number one priority for the next three weeks is to land safely on Mars. I consider it the obligation of every single person at the Lab to make it their highest priority. It is your obligation to raise any issue that might interfere with a safe landing.

#### Checks and balances

As you know, we are taking a wide range of actions on Mars Polar Lander in the areas of management, navigation, systems engineering, engineering, peer review, and mission assurance. We're doing this because the loss of Mars Climate Orbiter was, at its heart, an issue of teamwork. In the press conference I stressed the importance of checks and balances because of the need to ensure we are functioning as a team throughout the Laboratory.

Teamwork is not just an idea; it's a way of working. Teamwork means that we are willing to listen to one another. Respect one another. Help one another. And what all of us need to do now is support the Mars team. How? In any way you possibly can. And let me share some ideas.

#### Staying focused

- You can help the Mars team stay focused by staying focused yourself. Dwelling on yesterday is not going to help us land on Dec. 3.
- You can help the Mars team by not engaging in fault finding. Fault finding is not going to help us land on Dec. 3.
- It is also going to be very easy to become distracted by the media. Concentrating on today's headlines is not going to help us land on Dec. 3.

#### Rumors

The NASA report has many excellent recommendations for Mars Polar Lander—and we are acting upon all of them. That means we are

questioning everything—from top to bottom. But raising questions is not the same as concluding that something is wrong. Rumors have already gone from our hallways to the Internet and then into mainstream print and broadcast media. In this way rumors can take on the appearance of conclusions, and that can be source of further distraction. We just completed an in-depth look at the Polar Lander design by our engineers. Although there is a lot to do in the next three weeks, we know of nothing that stands in our way of landing safely on Dec. 3.

But now let me talk about the importance of today and what it means for JPL's future. We are in the midst of one of those rare instances when we know not only that history is being made, but we are a part of how that history will be remembered. This is, without question, a defining moment. What the Laboratory will be doing 10 years from now—and indeed the very nature of our space science program—is going to be determined here and now.

The future will depend on what we collectively learn from the loss of Mars Climate Orbiter.

- Can we learn to accept and learn from by our failures as well as our successes?
- When we fail, do we learn to fix the blame on individuals or do we learn to accept failure as a team?
- Do we learn that the pain we experience in losing a mission is so great that we avoid difficult challenges? Or do learn to accept the challenges, knowing that either great satisfaction or occasional disappointment awaits.
- Do we learn that teams must be large enough to be self sufficiently successful? Or do we learn that the success of small teams is reliant on JPL as a whole working as a team?
- Do we learn that each mission must have its own independence and autonomy? Or do we learn that we need to embrace interdependence and teamwork?
- Finally, do we learn out of this experience that this new era of space exploration is too difficult to pursue, or do we learn how to improve our success in going often, landing, and bringing samples of our solar system back to Earth?

Let me tell you what I believe about all these options. My choices are to embrace the tremendous future that can be ours. But just as our past successes did not come easily, neither will the future. In the future, success will be defined not only by what we do, but how we do it. And how we do it starts now.

In closing, I want you to know how proud I am of you. I know you care very much. I know you are dedicated to being the best. There's no better lab in the world. We have our work cut out for us. But we can do it. And when we do, we will fly high again. Thank you.

*"This is, without question, a defining moment. What the Laboratory will be doing 10 years from now—and indeed the very nature of our space science program—is going to be determined here and now."*

*Dr. Edward Stone*





## Service Awards

The following employees were honored this fall for 20 or more years of service at JPL:

**40 YEARS**  
Edward Cuddihy, Saterios Dallas, Raymond Freeman, William Frey, Clifford Heindl, Joseph Plamondon, David Scaff.

**35 YEARS**  
Bruce Anspaugh, John Ashlock, Albert Brejcha, Leonard Efron, Richard Horttor, John Hultberg, John Hunter, William Jensen, Lawrence Lim, David Miller, Theodore Pavlovitch, Samuel Petty, Timothy Scheck, C. Joy Young.

**30 YEARS**  
Antal Bejczy, Larry Dean, G.J. Dick, C.D. Hagood, Robert Koukol, Matthew Landano, Robert Mackey, Kerry Nock, Paul Ottenfeld, David Oth, Frank Palluconi, Stanley Petrick, Ralph Reichert, Ralph Reid, Alfred Silliman Jr., Robert Sniffin, Yolanda Walton, James Williams.

**25 YEARS**  
Vickie Baxter, Richard Cowley, Dorothy Crawford, James Graf, Douglas Griffith, Alan Harris, Stuart Heller, Deborah Johnson, Anne Kahle, Deborah McCarty, James McClure, Edmond Momjian, Diane Newmark, Edward Olsen, Wayne Schubert, R. Frank Tillman, Ronald Zenone.

**20 YEARS**  
Olga Adame, Charles Beichman, Gajanana Birur, N.T. Brady, Rose Carden, Leslie Compton, Reginald Cormier, Cheryl Degyurky, Mariejose Deutsch, Stephen Dombrowski, Robert Downer, David Durham, Stephen Edberg, Robert Frisbee, Robert Glaser, Candice Hansen, Pamela Harman, Thomas Hill, Jack Jones, Charles Kaczinski, Roy Kakuda, Harold Kirkham, Sanford Krasner, Fuk Li, Glenn Macala, Jeanne Makihara, Lute Maleki, John Miranda, Firouz Naderi, Allen Nikora, Peter Perius, Donald Rapp, Mary Reamer, Virgil Shields, Robert Sible, Jr., Andre Stefanovich, Eugene Trinh, David Tyner, Richard Vasquez, Victor Vilhrotter, John Walsh, Shyh Wang.

## Award for Excellence

Nominations sought for cash award program

The Award for Excellence gives employees at any level of the organization a chance to nominate other JPL employees whose accomplishments are outstanding. Currently, management has various tools available to them to reward and recognize employees—bonus awards, lump sums, and merit increases, to name a few. However, *this* program provides the opportunity for any JPL employee to identify and nominate other JPL employees (for example: peers, customers or suppliers).

Submitters are not required to obtain approval before submitting a nomination. However, the submitter must be knowledgeable about the accomplishment and must be able to complete and submit a nomination form.

Award recipients are selected by a committee comprising a well-balanced

representation of the Lab's population. The committee consists of at least one representative from each directorate and no committee member is higher than a Level II Manager.

The committee determines award recipients by using a vigorous and structured selection process over approximately 25 hours that includes reviewing, discussing, validating and clarifying nominations.

For the year 2000 award cycle, accomplishments must have occurred between Dec. 1, 1998 and Nov. 30, 1999. Nominations from technical organizations (3X, 5X, 7X, 8X, and 9X) will be accepted Nov. 29 through Dec. 17, 1999 and nominations from business/administrative organizations (1X, 19X, 2X, and 6X) will be accepted Jan. 3–21, 2000.

For program requirements and the nomination form, visit the Award for Excellence home page at <http://eis/sec614/reward/> and click on "2000 Call for Nominations and Nomination Form" under Award for Excellence. For any other assistance call the Reward & Recognition Program Office at 4-3825.

## Letters

Our family would like to thank the Optical Communications Group for the beautiful flowers, JPL ERC for the plant, and all of our friends who expressed their condolences in recognition of our recent loss.

Keith Wilson

I would like to thank all my friends at JPL and CISM for supporting me during the very difficult days since the passing of my dear brother, Peter Alkalaj, six months ago.

Leon Alkalai

I'd like to thank the ERC for the beautiful plant, and thank my coworkers for their support, on the death of my mom. I appreciate the spirit in which so many have encouraged me. Thank you!

Alan Mazer

My thanks to friends and coworkers for their expressions of support after the recent death of my father. Thanks also to the ERC for the beautiful plant. All of your thoughtfulness is sincerely appreciated.

Andrew Mishkin

## Passings

**RICHARD MACGILLIVRAY**, 65, a retired senior support staff member in Section 662, died of a heart attack Sept. 16 at his home in Sierra Madre. MacGillivray joined JPL in 1975 and retired in 1998. He is survived by his son Richard, daughter Terrie Frontino, six grandchildren and one great grandchild.

Services were held Oct. 8 at Riverside National Cemetery.

**H. LOWELL SMITH**, 66, a retired senior computer analyst from Section 367, died of multiple myeloma Oct. 16 at his home in Mission Viejo.

Smith worked at the Lab from 1962–93. He is survived by his wife, Jacqueline, son Kevin and daughter Sherri Martin.

Services were private.

**SUSAN MCMAHON**, 51, program manager for JPL's Planetary Data System in Section 389, died of cancer Oct. 20 at her home in La Cañada.

McMahon had worked at the Lab since 1969. She is survived by her parents, Michael and Alberta, and sister Linda.

Services were held Oct. 30 at Forest Lawn in Glendale.

**ROY TYRRELL**, 86, a retired member of the technical staff in Section 314, died of heart failure Oct. 20.

Tyrrell worked at JPL from 1950–75. He is survived by niece Nancy Burch. Services were private.

## Classifieds

### For Sale

AIRLINE TICKET, American Airlines, R/T, anywhere in contiguous US, must be used by Feb. 2000. \$350/obo. 714/903-8888.

APPLIANCES, vacuum cleaner, canister, Regina w/attach., fair cond., \$25; steam iron, GE Power Spray, vg cond., \$18; floor lamp, black base & pole, off-white shade, gd. cond., \$15; table-top TV antenna, RCA, vg cond., \$10. 626/577-8107.

BABY ITEMS, cradle, incl. sheet & matr.; \$40; exersaucer \$35; infant car seat, infant snugli, asstd. infant clothes, blankets, shoes, jumper seat, all in gd. cond., & reasonably priced. 626/798-6248.

BAR STOOLS, set of 4, unfin., heavy duty wood w/arms & swivel seats, Early American, \$200/obo. 957-3022, eves.

CABINET, Barsley, walnut, 57" w x 25" h, like new. \$100/obo. 248-4254.

COMPUTER, Gateway laptop, Solo 9100 SE, 14.1" active matrix screen, 233MHz Pentium II, 2GB HD, 64MB SDRAM, 4MB SGRAM, 2 USB, 33.6K modem, 20x CD-ROM, Win98, Office 97, much more. \$1,000. 626/351-6741.

COMPUTER, Mac 5300cs, 100MHz 603e, 48MB RAM, 750MB HD, color screen, ext 28.8 modem, ext ZIP, MAC OS 7.5.1 & 8.0 ext CD, case, cords, 1 batt., PC cardports, IR docking, etc., some SW, don't use anymore, \$400. 626/345-9807.

DINING ROOM SET, maple, 7 pc., 4 chairs, 2 captains chairs, 42" w x from 5' to 7 1/2' l, gd. cond., \$600/obo. 626/355-2957.

DISHWASHER, portable, SearsKenmore model #587-17345691, \$200. 626/857-3753.

DRYER, Whirlpool, elec., exec. cond., 4-yrs. old, \$150. 626/577-4922.

FAX PRINT CARTRIDGES, black, Brother PC201, 1170/1270/1570MC & MFC-1770/1970, never used, pd. \$25.99/ea., sell \$18/ea. 626/443-9774.

FURNITURE, large oak roll-top desk, exc. cond., \$350; beautiful solid oak Whirlitzer piano, console model, full keyboard, exc. cond., \$2,500. 805/527-7017.

FURNITURE, din. rm, Ethan Allen cherry wood server, Georgian Court Collection, 40" x 21" x 34", exc. cond., 1/2 retail price \$785; mtchg. wall-mounted shelf, \$40. 626/577-8107.

GUITAR, jazz, guild, ISO D Savoy, 2/pu elec., archtop, custom order, gold hardware, X700 Seymour Duran p/u's, Sunburst case, brand new, \$1,395. 249-2357.

GUITAR AMPLIFIER, Rivera Sedona, electro/acoustic, 55W/2 ch., beautiful acoustic/piezo sounds, classic tube tone, JBL speaker, exec. cond., list \$1,900, sell \$1,000. 626/447-3922.

HUMMELL COLLECTION, appx. 75 pc., many old trademarks & retired figurines. 626/359-7666.

LOCOMOTIVE, LGB, mod. 21251, 20 hrs. operation, \$500/obo; telescope w/tripod, older Celestron C8, \$250. 790-0697.

MISC, back massaging syst. w/heat, Conair; fits on chair, \$35; bookshelf, birch, new, 24" w x 10" d x 30" h, \$30; dresser, white, 5-dr., 29" w x 16" d x 42" h, on whls., \$50; table, press-board, 3-legs w/cover & glass, 19 1/2" round x 23" h, \$10; TV cart, oak, on casters, space for VCR & covered storage below, \$40. 626/398-4960.

MISC, refrigerator freezer, ice maker, GE, 21 cu. ft., exec. cond., \$300; refrigerator freezer, Whirlpool, 17 cu. ft., exec. cond., \$50; sofa bed, queen, upgraded matr., n-blue/tan, exc. cond., \$300; color TV, Zenith, 25", console, remote, \$50; coffee table, walnut, exc. cond., \$100. 626/793-7879.

MISC, bar stools, oak, swivel seat, \$80/pr; stove, Gaffers & Sattler, gd. cond., works great, \$35; 27" color TV, works, may need some repair, \$25; entertainment cabinet, fits up to 27" TV & stereo, light oak, \$75. 626/334-1535, after 6pm.

MISC, new deluxe Sony remote, good for all Sony TVs, big-screens, satellite, DVD, VCR, PIP, etc., \$29; new satellite signal booster, \$12; laptop modem card, \$19; ZIP disks, \$7; MS Publisher '97, \$19; garage remote, \$15; new joystick, \$3; new deluxe ergonomic keyboard, \$15; Garden Weasel, used once, \$9. 366-6134.

MISC, brass headboard & bedframe, king sz., repro., exc. cond., \$50/both; queen metal bedframe, \$20; vert. blinds, 2 pr., ivory, like new, 82" w x 84" l x 66" w, \$60/both; vent/light hood

for over stove, gd. cond., white, \$20; light fixtures, brass/glass, one 5-lamp hanging chandelier, 1 ceiling mount, exc. cond., sell as pr., \$50/both; firewood, mixed, seasoned, you p/u, \$150/cord. 626/794-6860, eves.

MISC, fuumatt, \$60; dishes, Mikasa, \$75; furniture, leather, liv. rm, \$400; desk, big, \$50; coffee & end table, marble, \$700; dining set, 6 chairs, leaf, \$250. 626/577-7576.

MODEMS, 3 external, USR V.Everything, 56K, \$125; USR Sportster, 28.8K, \$50; Cardinal, 33.6K, \$25. 626/791-1779.

PRINTER, Canon BJC-1000, brand new, unopened box, \$50. 323/464-2762.

REFRIGERATOR, Amana 22 cu. ft., side-by-side, ice maker & cold water, white, exc. cond., 2 yrs. old, \$400/obo 626/357-3230.

RING, diamond, .51 wt., velvet inner box & gift box, pd. \$800, sell \$700/obo. 362-3358.

STROLLER, side-by-side, collapsible, reclines, removable sun shade, gd. cond., \$60. 626/355-9733.

TRUMPET, '65 vintage conn. + case, 2 mutes, make offer. 626/797-4758.

### Vehicles/Accessories

'95 ACURA Legend LS coupe 2 dr., black, auto, 104,000 mi., mint cond., leather, sunroof, heated seats, alloy wheels, CD changer, remote keyless entry, \$22,000/obo. 626/568-8298.

'91 ACURA Integra LS, 3-dr. hatchback, auto., 121K mi., AM/FM/cass., pwr. win., gd. cond., \$4,200/obo. 562/789-1963.

'89 ACURA Integra LS, 2 dr., orig. owner, compl. serv. records, AC, AM/FM cass., alarm, tint wdws., car cover, 5 sp., metallic blue, runs exc., \$3,100/obo. 626/443-9774.

'96 CHEVROLET LS S10 pick up, short bed, 4 cyl., 5 speed, A/C, pwr. steering, ABS brakes, AM/FM stereo cass., tinted wdws., bed liner, 37,000 mi., \$8,000/obo. 626/287-8504.

'81 FIAT Spider 2000, black/tan, fuel inj., body/engine/tires in great shape, smog checked, \$2,900. 323/225-1732.

'70 FORD Mustang, hard top, 6 cyl., auto, gd. body, not running, \$1,000/obo. 626/797-0115.

'86 HONDA "Shadow" VT 1100 motorcycle, im-mac., 26,000 mi., black, windshield, bags, back rest, exc. mechanically & aesthetically, \$3,100. 626/441-2150.

'91 INFINITI G20, gd. cond., 110K mi., 4 dr. sedan, 5-sp. manual, moonroof, A/C, pwr. win., leather seats, cruise ctrl., orig. owner, \$6,000/obo. 790-2558, eves.

'98 MITSUBISHI 3000GT, white exterior, auto, tan leather interior, 8-disc CD/Infinity sound sys., sun roof, pwr. win./mirrors, extended warranty, 11K miles, exc. cond., \$23,500. 626/398-4101, eves.

'88 MITSUBISHI Mighty Max pick-up, extended cab, 2.6L eng., rack over bed & cab, runs vg, gd. stereo, \$2,500. 956-6603.

'92 NISSAN Pathfinder XE, V6, 4-dr., 50,000 mi., loaded, tinted windows, many access., compl. serv. records, mint cond., \$12,000/obo. 626/443-9774.

'87 NISSAN King Cab p/u SE w/bed liner & shell, new tires, radiator, timing chain, seat covers/mats, a/c, AM/FM stereo, gd. cond., \$4,000/obo. 353-2976.

'87 NISSAN Stanza, 4 dr., auto., pwr. win., 140K mi., \$2,000/obo. 626/576-5983.

'95 PLYMOUTH Acclaim, 4-dr., silver-gray, auto, a/c, PS/W/L, cruise, tilt whl., V6, 90K mi., AM/FM/cass., very roomy, 6-pass., orig. owner, gd. cond., \$4,950. 790-0335.

'95 SATURN SL-2, 4-dr. sedan, A/C, AM/FM/tape, cruise, 5-spd., exc. shape, 28K mi., \$7,900. 626/797-3310 eves. & wkends. SHELL for full-sz. Ford, blue, incl. carpeted benches, storage to fit truck bed, \$350/obo. 626/797-5387.

TIRE CHAINS, bought to fit Ford Ranger, never used, \$20. 626/798-7339.

TIRES, set of GoodYear Wranglers, less than 100 miles, LT 245/75R16, \$200. 626/395-6142, Terry.

'95 TOYOTA Supra SE, pwr. win./locks/ antenna, CD, FM/AM stereo, black/black, 58K mi., salvage title, exc. cond., \$17,000/obo. 909/599-3230.

'88 TOYOTA Corolla wagon, 129K mi., good cond., \$2,800. 957-6821.

TRAVEL TRAILER, 21 1/2 ft., slps. 6, fully self-contained, \$2,000. 626/798-6248.

### Wanted

CARPOOLER, from L.A. traveling north on

Glendale fwy. Ext. 4-6791, Mr. Racys.

CARPOOLER, West Covina area to share commute, leave W. Covina by 7 a.m., lv. JPL 4:15 p.m. looking to save gas and enjoy gd parking? 626/641-0319, Susan.

INTERNSHIP, high school senior, seeks hands-on problem solving or creative thinking, payment not requisite. Talan486@aol.com.

MUSICIANS, collaborate w/drummer, trumpet, bass, congas, singer, influence range from Rage Against the Machine to Phish to Mike Davis, int. in writing & gigging, all styles welcome, no ego or flakes. 626/796-1170.

SPACE INFORMATION/memorabilia from U.S. & other countries, past & present. 790-8523, Marc Rayman.

### For Rent

ARCADIA, 2 rms. in 5-bd., immac. house, grt. loc., full privileges, pool, lg. yd., quiet setting, no smoking/pets, \$800. 626/836-5734.

LA CRESCENTA, priv. setting above Foothill, 2 bd, f/p, pool w/service, gardener, \$1,400. 952-6007.

PASADENA, rm. in 3-bd. apt. to share w/2 others, pool, parking, a/c, washer/dryer, \$460 + 1/3 util. 626/564-1078.

PASADENA apt., 2 bd., 2 ba., fully furn., carpets, a/c, townhome style, laundry facil., carport, 2 mi./PCC/Caltech, avail. Nov. 20, \$900 + util. 626/351-9641.

PASADENA apt. to share, 2 bd., 2 ba., fully furn., carpets, a/c, laundry facil., carport, 2 mi./PCC/Caltech, avail. Nov. 20, \$450 + 1/2 util. 626/351-9641.

SOUTH PAS., fully furn. studio apt., nice area, 1718 Huntington Dr., btwn. Marengo & Milan Sts., car space, laundry facil. on premises, utilities pd. non-smoker, no pets. \$565. 626/792-9053, Marilyn.

### Real Estate

PASADENA, 3-bd. 2.5-ba. townhome built '98, nr. Rose Bowl, 3.5 mi./JPL, gated, 1,440 sq.ft., cen. h/a, 2-car att. gar., prof. org. closets, tiled f/p, alarm, ceiling fans w/lights in all bd., covered balcony off master, Pergo maple flrs. everywhere, Corian counters, lrg. encl. backyd., fully landscaped w/auto sprinklers, palm/fru trees, pool/Jacz., basketball ct., \$255,000/obo. 626/568-8298.

### Vacation Rentals

BIG BEAR cabin, nr. village, 2 bd., slps. 8, compl. furn., f/p, TV/VCR, \$75/nt. 249-8515.

BIG BEAR LAKEFRONT, lux. townhome, 2 decks, tennis, pool/spa, beautiful master bed suite, slps. 6. 949/786-6548.

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

HAWAII, Kona, on 166 feet of ocean front on Keauhou Bay, priv. house & guest house, comfortably sleep 6, 3 bd., 2 ba., rustic, relaxing & beautiful, swim, snorkel, fish, spectac. views, near restaur., golf courses, other attractions. 626/584-9632.

HAWAII, W. Maui beach luxury condo on ocean front, fully furn. 2 bd., 2 bd., kitch., \$140/day for 2. 805/646-0810.

LAS VEGAS, rm. in priv. home for New Year's, close to Strip, 702/251-9021, Rick or Laura.

LAKE TAHOE, west shore ski chalet, close to northern ski areas: Homewood, Alpine.Squaw, etc.; walk to lake, slps. 8, 3 bd., loft, 2 ba., linens provided, full kitch. & laundry, TV/VCR, wood stove; 3-day min., JPL disc., \$75 cleaning fee. 626/585-0321, Bob or Nicole.

MAMMOTH, Chamonix condo, at lifts 7, 8, 16, 17; walk to Warming Hut, 2 bd., 2 ba., sleeps 6, fully equip. elec. kitch., microw. & extras, f/p & wood, color TV, VCR, cable, FM stereo, o/d Jacz., sauna, game, rec. & laundry rms, walk to shops, lifts, special midwk rates. 249-8524.

MAMMOTH condo, studio + loft, 2 ba., f/p w/wood, Jacuzzi, sauna, game rm., color CB, TV/VCR, full kit. w/microw., terrace, view, amen. 714/870-1872.

MAMMOTH, Snowcreek, 2 bd., 2 ba., + loft, sleeps 6-8, fully equipped kit. incl. mcrow., D/W, cable TV, VCR, phone, balcony w/view to mtns., Jacuzzi, sauna, streams, fishponds, close to Mammoth Creek, JPL discounts. 626/798-9222 or 626/794-0455.

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

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

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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](mailto: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.