

THE AMES

# Astragram



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

AMES RESEARCH CENTER, MOFFETT FIELD

August 2, 1999

on-line at: <http://ccf.arc.nasa.gov/dx/>

## Ames' Lunar Prospector set to "shoot the moon"

As we go to press, the mission of Lunar Prospector, the first of NASA's Discovery class of "faster, better, cheaper" space missions, is scheduled to officially end at 2:51 a.m. PDT on July 31 with a controlled impact on the surface of the moon. If all goes according to plan, that will conclude what may well prove to be the most cost-effective and science-rich space exploration mission in NASA history to date.

In a final effort to determine conclusively whether there is water ice on the moon, ground controllers are hoping to crash the spacecraft into a permanently shadowed crater near the southern lunar pole. Scientists are gambling that the estimated 3,800 mph impact will liberate debris and vapor that may be detectable for up to 14 hours. Teams will use the Hubble Space Telescope and others at the McDonald and Keck Observatories and additional

locations to seek positive evidence of water vapor. They will be joined by thousands of amateur astronomers around the world. While the probability of success is low, this final science "splash" is a fitting end to a mission that has exceeded all expectations.

"Regardless of the outcome of this final experiment, Lunar Prospector has yielded a gold mine of science data," said Dr. Henry McDonald, Ames Center Director. "We now have a much better understanding of the origin, evolution and composition of the moon. Prospector has yielded global maps of the moon's gravitational and magnetic fields, provided information about the location and abundance of key lunar elements, and teased us with the prospect of abundant water-ice at the moon's poles. It is a scientific bounty almost beyond comprehension," he said.

Prospector was launched on Jan. 6, 1998 from the Kennedy Space Center, FL. After a four-day journey to the moon and following lunar orbit insertion, the spacecraft's suite of 5 science instruments began sending data back to Earth from the vehicle's circular polar mapping orbit. This provided

the first complete set of high-resolution lunar data, an important complement to the very limited data from the Apollo era that focused strictly on the Moon's equatorial regions.

that have created the two smallest magnetospheres in the Solar System. These regions are now believed to have formed as a result of titanic impacts on the directly opposite side of the moon.

Another scientific first is the development of the first global maps of the moon's elemental composition. The location and global abundance of 11 key elements, including hydrogen, thorium, potassium and iron, are now known to a high degree of certainty. LP scientists have also confirmed that, while the moon has a chemical composition very similar to that of Earth, its iron-rich lunar core is decidedly smaller by comparison. This lends support to the "giant impact" theory that suggests the moon was formed when material was ripped from the Earth during a collision with a Mars-sized object and then recreated in Earth orbit.

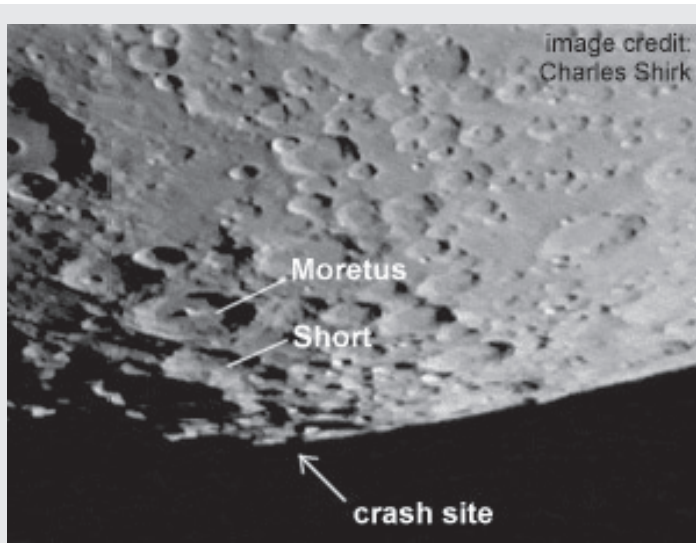
After making over 6,800 mapping orbits of the moon's surface, Prospector has now yielded an abundance of scientific data, achieved all mission objectives, exhausted the bulk of its fuel and battery power, and exceeded its design life. Its final plunge into a crater at the moon's south pole is a final attempt to squeeze one last piece of science data from a mission that has already surpassed expectations.

Further information about Prospector and its science data return can be obtained at the project website at: <http://lunar.arc.nasa.gov>

Additional information about the mission-end sequence is available at the following URL: <http://www.ae.utexas.edu/~cfpl/lunar/>

Lunar Prospector was built by Lockheed Martin, Sunnyvale, CA and managed for NASA by Ames. Organizations cooperating in the research and operation of the mission included Ames; the Lunar Research Institute, Gilroy, CA; the Department of Energy's Los Alamos National Laboratory, NM; and NASA's Goddard Space Flight Center, Greenbelt, MD, and Jet Propulsion Laboratory, Pasadena, CA. An external team of scientists led by Dr. David Goldstein of the University of Texas at Austin is conducting the analysis of mission-end data.

BY LAURA LEWIS AND DAVID MORSE



Lunar South pole indicating the "hoped-for" final resting place of Ames' Lunar Prospector spacecraft.

In March 1998, scientists announced their first tentative findings that suggested the presence of water ice in permanently shadowed craters of the moon's north and south poles. In September, they estimated that up to six billion metric tons of water ice may be buried at the lunar poles. Their models also suggested that the water ice may be more concentrated than originally thought, and buried under as much as 18 inches of lunar soil. However, they cautioned, the evidence is indirect, based on reasonable scientific assumptions given the levels of hydrogen detected.

Since then, Prospector data has been used to develop the first precise gravity map of the entire lunar surface. This includes identification of at least seven new mass concentrations — lava-filled craters on the lunar surface that are known to cause gravitational anomalies. The new gravity maps will provide accurate information essential for any potential future human or non-human moon missions.

Further, while the moon's magnetic field is relatively weak, Prospector has confirmed the presence of local magnetic fields

## H. Julian Allen award has a new recipient

One of the most remarkable honors an Ames Research Center scientist can wish for is the H. Julian Allen Award, which has been awarded for nearly three decades to the best technical paper with an Ames scientist as the senior author. The legacy of H. Julian

Dr. Hanwant B. Singh, who has been leading a group of atmospheric scientists at Ames since 1985, has studied the composition and chemistry of the atmosphere for twenty years. At the award ceremony on July 20, he was presented with the H. Julian Award for his paper titled "High Concentrations and Photochemical Fate of Oxygenated Hydrocarbons in the Global Troposphere," which was published in *Nature* in 1995. This work is one of a hundred and fifty publications in the field of atmospheric chemistry written by Singh.

Singh is a highly accomplished scientist: he is an Ames Associate fellow, NASA Exceptional Scientific Achievement Medal winner, and Frank A. Chambers award recipient. He has devoted more than a decade of his professional life to the study of air chemistry. This time, he and an international team of scientists Maria Kinakidou (CNRS, France), Paul Crutzen (Max-Planck Institute, Germany), and Daniel Jacob (Harvard, Mass) conducted an experiment trying to find out what makes the atmo-

sphere change over the years and how human activities impact the troposphere--the lower layer of the atmosphere. While conducting the study, the researchers never

physically met, but the common goal of learning more about the atmosphere joined great minds together.

"We have to understand how nature works before we can predict future consequences resulting from human activities," said Singh. The researchers found a new mechanism by which the biosphere controls many key aspects of the atmosphere. Singh says that the next step would be "to find other ways nature protects itself."

The significance of Singh's study is tremendous. It is the first step to defining and explaining how human activities might affect the atmosphere's ability to cleanse itself, which is essential for human survival. The scientific importance of this publication was recognized by the Ames Basic Research Council, which honored Singh with a \$5,000 prize.

In return, Singh emphasized his appreciation for the wonderful environment that Ames provides for scientists. "It is quite remarkable that we have collected data from the remotest corners of the earth and worked with scientists across continents towards the common goal of understanding and protecting the earth's environment," said Singh.

BY VICTORIA KUSHNIR

## In Memoriam

Daniel (Dan) H. Cathcart passed away on Saturday, July 17 at his home in San José from an apparent heart attack. Cathcart was a Contracting Officer in the Acquisition Branch for Center Operations and Space and had been colocated in Building 244 for many years supporting major Space Directorate acquisitions.

A memorial service was held on Saturday, July 24 at the Darling and Fischer Garden Chapel, 471 E. Santa Clara, San Jose, CA.

The family requests that donations be made to the Ames Child Care Center, Mailstop T-20D, Moffett Field.

BY JOHN BLUCK

## In Remembrance

Robert (Bob) Ogle passed away on July 9. For the last 6 years, Ogle worked at Moffett Field as the Environmental Manager of the 129th RQW. He also worked at NASA Ames for many years as a security guard and as a Civil Servant.

Bob is survived by his wife Nikki and 3 daughters, Rhonda Peek, Dina, Jennifer and grand-daughter Tawny. Bob will be missed by his colleagues and the many friends he made while at Moffett.



photo by Dominic Hart

Center Director Dr. McDonald chats with Dr. Hanwant Singh following the recent H. Julian Allen award ceremony.

Allen is living on in the works of many talented and highly devoted Ames researchers. This year's recipient is not an exception.

## Picasso appointed to supercomputing post

David R. Picasso was appointed as the new Director of the Consolidated Supercomputing Management Office (CoSMO) at Ames on July 10. Picasso succeeds John Ziebarth, who is now the Deputy Division Chief for the Numerical Aerospace Simulations (NAS) Systems Division (Code IN).

Ames is NASA's lead center for supercomputing. Through CoSMO, Ames is responsible for the acquisition, maintenance, operations, management, upgrading and budgeting for NASA's supercomputers regardless of location and function.

"David Picasso brings a wealth of experience to his new position," wrote Ames Director, Dr. Henry McDonald, in a memorandum to Ames resident staff. "He is a graduate of the Stanford Sloan Program and has held executive level positions with NASA and the Department of Energy."

The scope of supercomputing resources within NASA includes high-speed processors, mass-storage systems and network interfaces. The supercomputers include production, research and development and secure computer engines.

# NASA study helps show how aerosols could cool atmosphere

Global climate change, that some scientists say is caused by rising levels of green house gases in Earth's air, may be affected by the cooling caused by floating aerosols. This includes smog that blocks sunshine, according to a NASA-funded study conducted over the North Atlantic Ocean.

Results of the study were released in an article published in the June 15 issue of "Geophysical Research Letters." Dr. Robert W. Bergstrom of the Bay Area Environmental Research Institute, San Francisco, CA, and Ames scientist Dr. Philip B. Russell (SGG) are authors of the article.

They also presented their results on July 23, during the International Union of Geodesy and Geophysics Conference at the University of Birmingham, in the United Kingdom.

"We found that small particles in the atmosphere over the North Atlantic reflect sunlight and could affect scientists' global climate change predictions," Bergstrom said. "We combined satellite, airborne and ground-based data gathered from field observations to compute how large the aerosol effect is."

Aerosols in the atmosphere come from combustion, mineral dust, organics, paint and other condensable chemicals. Smog contains aerosols as well as other materials and gases. Aerosol particles are small enough to remain in the atmosphere for as long as a week or so.

"The importance of our study is that it helps show scientists how to better combine data we gather by satellite, aircraft and

ground observation," said Russell. "Combining data like this is essential for researchers to learn how human-made aerosols are impacting the climate."

"Our key calculations are based on a theoretical cloudless sky, and the result of those computations indicates that the natural and human-made aerosols cool the atmosphere about 3.5 watts per square meter on the average over the Atlantic," Bergstrom said. "At the same time, the human-made carbon dioxide heating effect is about 2 watts per square meter; but one of the biggest uncertainties in everyone's calculations is the effect of clouds."

"The North Atlantic is a very cloudy place, and when you factor in the cloud effect on reducing sunlight, then the aerosol effect is reduced to 0.8 watts cooling per square meter because the clouds have already blocked much of the sunlight," he explained.

"Although the numbers for aerosol cooling and carbon dioxide heating of the Earth are similar, and the aerosols may reduce overall warming, we must be careful because there are uncertainties in aerosol properties," Bergstrom said. "For example, aerosol cooling depends on how much soot you have in the polluted air mass; the more soot there is in the aerosol layer, the less cooling there is." In addition, atmospheric scientists say that the current uncertainty factor in aerosol climate cooling calculations is about two.

"Many of the aerosols are natural, but

what is most important is how the human-made aerosols are entering the atmosphere and changing," said Russell. Sulfates from burning are a large part of human-made aerosol particles.

Using observations from four satellites, land sites, ships and aircraft including the high-flying ER-2 and lower flying C-130, C131A and Cessna aircraft, scientists gathered data for the study from July 10 - 31, 1996, over the mid-latitude North Atlantic during the Tropospheric Aerosol Radiative Forcing Observational Experiment. Russell was NASA's coordinator for that experiment.

"The North Atlantic area is impacted by the summer plume of U.S. East-Coast smog and organic aerosols," Bergstrom said. "That's why we conducted the study over the Atlantic, right off the East Coast."

The scientists say that their study is not conclusive because researchers must gather more data to lower the uncertainty of their conclusions. "We gathered data only over a part of the North Atlantic, and that's a very small portion of the globe," Bergstrom cautioned.

Another aerosol study, the Asia Aerosol Characterization Experiment, is slated to begin in the year 2000, and will focus on the aerosol plume coming from Asia. "Eventually, we would like to gather enough data from ground stations, ships and airplanes to make accurate world-wide measurements of aerosols from satellites," Bergstrom said.

BY JOHN BLUCK 

## Student Astrobiology Prospects

For the third consecutive summer, Ames is providing graduate students with an excellent educational opportunity. If it were

Ames, it is known as the Astrobiology Academy. This academy is co-sponsored by Ames along with the National Space Grant College and the Fellowship program.

This ten-week academy is designed as a 'hands on' learning experience for college graduate students. Individually, each student assists on a research project related to astrobiology. As a group, the students work on developing a hypothetical research project proposal.

"Hopefully, the program will further influence students interested in astrobiology. Who knows? Some day they may be the future leaders here- expanding the astrobiology frontier," said Douglas O'Handley, director of the academy.

Not only do the 13 students work together, they also share a roof. They all live in a house located on the campus of Stanford University.

Brennan Gantner, the only student studying in California said, "We got to know

each other real quick, like in four days. We're all friends now, and we work well as a team."

Students have also had the chance to break free from their labs to be crammed into a single government van without windows! The educational trips taken have been worth it, though. They recently visited the X-33 and by next week they will be at JPL in Pasadena to learn about Mars, the Galileo mission to Jupiter, and the Cassini mission to Saturn.

As the end of summer approaches, these students of the third Astrobiology Academy gathered on July 22 in the Space Sciences Research Laboratory building for a mid-term. Actually, there was no test issued; instead, they gathered to share the progress of their Astrobiology research projects.

The students each gave a twenty-minute, PowerPoint presentation to their peers. The principal investigator of each research project was also on hand to ob-

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photo by Jason Miller

Astrobiology Academy students gather around to review a Power Point presentation.

in a school's course catalogue, maybe it would be called "Astrobiology 101." But at



# Ames Family Safety Fair is huge success



photos by Tom Trower

Rick Serrano, ISO 9001 program manager (upper left), with granddaughter Elizabeth watching one of the entertainers at the Family Safety Fair.

It's safe to say, the Ames Family Safety Fair held July 15 beside the Ames Café was a roaring success.

Hundreds of Ames employees turned out for the activity, which featured "Magic Mike, the Sorcerer of Safety" performing in a magic show that highlighted tips for working and playing safe. Also featured were 25 colorful booths offering safety and health information on topics ranging from eating safely to preventing disease. Free blood pressure, diabetes and body fat testing were also offered. The most popular booth for adults was the free stress evaluations, while for the children in attendance, the crowd favorite was Bamboola and the Humane Society's turtle, which taught safety around animals.

Michael Hulet, Ames' safety manager, kicked off the event with a warm welcome to the crowd, followed by David King, deputy chief of Code QH, who introduced Center Director Dr. Henry McDonald. During his remarks, Dr. McDonald stressed the importance of safety in the workplace



Kids enjoying the entertainment, the Tin Man, from the show Wizard of Oz.

and noted that NASA Administrator Dan Goldin also believes safety is critically important to the Agency.

If you and/or your family did not have a chance to attend and join in the festivities this year, don't worry. It's been rumored that, because of the importance and popularity of this year's Family Safety Fair, this will become an annual event.

BY DAWN EVANS

## Environmental brown bag lunch series starts off with a hoot

Does this critter look familiar? If you frequent the many trails at Moffett, you have probably noticed this bird, the Western Burrowing Owl, either perched on a fence or peering out of a hole.

Dr. Lynne Trulio, associate professor of the Department of Environmental Studies at SJSU, will kick off the environmental brown bag lunch series with her informal lecture on the owl. Sponsored by Code QE, the series is designed to increase people's awareness of environmental issues.

Bring your lunch and join us in the ballroom of the Moffett Training and Conference Center, Building 3, on Tuesday, August 3 at 11:30 to hear Dr. Trulio's 45-minute presentation and slide show. Learn about this fascinating creature which inhabits 32 nests at Moffett Field. Find out about Ames' protection

program for the burrowing owl and why protecting the owl can enhance our quality of life.



Contact Linda Vrabel of the Environmental Compliance Group at ext. 4-0924 if you have any questions regarding the brown bag lunch series or the owl presentation. We hope to see you there!

BY MICHELLE PERRY

## Student Astrobiology Prospects

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serve their student's presentations. Mostly, they stayed in the back of the conference room. Each PI did participate by helping their students answer questions that were asked in the discussion following the presentations. Students were relieved at the end of the day and relaxed with some strawberry cake.

The project topics ranged from breaking rocks into pieces, to studying the snail shaped vestibules in our ears. But Mars took the prize, attracting the majority of research efforts. Nathan Creech talked about 3-D mesh grids, that map the surface of Mars for potential mission landings. Bridget Smith displayed her web page intended to generate public interest about astrobiology. It allows users to simulate ecosystems found on Earth and apply them to Mars, showing how life would fare in a Martian environment.

The last challenge of the academy facing the students is the final that looms only a few weeks away. Students will gather once again to give a presentation. This time, they will be sharing the results of their entire summer's research.

BY JASON MILLER

### Center Briefs

#### **Historic Glenn mission and SOHO make major advance on 37-year-old solar mystery**

The high-speed portion of the solar wind achieves its unexpectedly high velocity—up to 500 miles per second—by "surfing" magnetic waves in the Sun's outer atmosphere, according to observations made by two spacecraft during John Glenn's return to space. For 37 years, solar scientists have been puzzled by the fact that the high-speed solar wind travels twice as fast as predicted by theory. Observations and theoretical analyses have discovered a surprising explanation for this mystery: magnetic waves. The observations were made using instruments aboard NASA's Spartan 201 spacecraft, deployed from the Space Shuttle during the STS-95 mission, and the international Solar and Heliospheric Observatory (SOHO).

#### **New space plane to be developed**

NASA and the Boeing company have entered into an agreement to develop an experimental space plane, the X-37, to test new technologies for reusable launch vehicles. The X-37 will be carried into orbit by the space shuttle or launched by a rocket. It will remain in orbit up to 21 days, performing a variety of experiments before reentering the atmosphere and landing. The space plane will also test technologies aimed at significantly cutting the cost of space flight.

#### **NASA scientists use satellites to help track a disease and keep it under control**

Using weather satellites to spot the early signs of an El Niño, scientists may be able to help save East Africans and their livestock from Rift Valley Fever, a mosquito-borne disease that can be fatal to humans and animals.

#### **Near Earth objects scale helps risk communication**

Planetary scientists have developed a new means of categorizing and explaining the risks associated with asteroids and comets that might collide with the Earth. A risk-assessment scale, similar to the Richter scale used for earthquakes, assigns values to celestial objects moving near Earth. The scale runs from zero to 10. An object with a value of zero or one will have virtually no chance of causing damage on Earth; a 10 means a certain global climatic catastrophe. The scale takes into account the object's size and speed, as well as the probability that it will collide with Earth.

The scale can be used at different levels of complexity by scientists, science journalists and the public.

## NASA photographs land at San Francisco Museum of Art

Spectacular, rarely seen scientific images charting the American exploration of the moon have been chosen for their high aesthetic achievement and will be presented in the upcoming exhibition "Full Moon: Apollo Mission Photographs of the Lunar Landscape," on view at the San Francisco Museum of Modern Art (SFMOMA) from August 20, 1999, through January 11, 2000.

The Apollo missions of 1967 to 1972 made an indelible impression on all who witnessed them from afar; a small number of universally recognized images taken on these missions have become icons of the 20th century. Over the last four years, San Francisco-based photographic artist Michael Light gained unprecedented access to the film masters of the NASA archive of 32,000 Apollo photographs. From these, he selected a small number using cutting-edge digital scanning techniques. Presented on the 30th anniversary of the first moon landing, Light's selection pushes beyond the few ubiquitous Apollo images to create a fresh understanding of the lunar landscape through images of unparalleled clarity and grand scale. These vast panoramas of the moon, seen both from above and on its surface, invite comparison with a long tradition of landscape images in art and photography and prompt a redefinition of our ideas of landscape and the sublime.

Full Moon features 51 unique photographic vistas, the distillation of Light's long obsession with the disorientation, brilliant clarity and dramatic immensity of the lunar surface. Originally inspired by the resonance Light perceived between lunar landscapes and a group of aerial photographs he was making over the desert of the American Southwest, Full Moon attempts to bring both the artist and the viewer as close as possible to experiencing this strange and wonderful environment. After selecting images and scanning NASA masters at high resolution, the artist spent over a year working with the digital files, to create exhibition-quality pictures. The images were printed on photographic paper using the latest in "direct digital" printing techniques, resulting in the sharpest, most pristine presentation of this imagery ever made. Light has printed these images, originally shot by the Apollo astronauts, on a scale that truly reflects the awe-inspiring nature of the lunar landscapes themselves—some prints range in size from 24.5 by 24.5 inches to 49 by 192 inches. He has also arranged them in discrete sections, one of them expressing the minimalist beauty of the moon seen as an object from far away. The formal elegance of these pictures, taken at a distance of many miles from the moon's distinct surface, is inspiring. Among

the most attractive pictures in Full Moon is a photograph of the Hadley Rille, an ancient volcanic lava tunnel. This image embodies one aspect of Light's view of the lunar landscape: "the most classically beautiful of the images judging by earthly scenic and landscape norms." Taken by Apollo 15 astronaut James Irwin, the photograph captures the seductive essence of this winding canyon, which is a mile wide and stretches over 80 miles in length.

The exhibition also includes pictures that offer another, more complex view of what a landscape image is and might be, images that document the Apollo astronauts interacting with their foreign environment and the equipment they used on the missions. A photograph of Apollo 15 astronaut Dave Scott records the scientific sampling of the moon's primordial crust. The photograph's documentary intention is nearly eclipsed by its richly layered visual composition. The manner in which black-and-white film reacts to an absence of atmosphere creates dramatic, velvety shadows; here the startling contrast between the bright metallic highlights on the tools and the soft, heavy shadows underscores the invasive nature of much human exploration.

Not only do the Full Moon photographs represent the only alien landscape that human beings have had the opportunity to record personally on film, for Michael Light they implicate, in a truly original way, "both the seduction and violence of territorial expansionism—in particular, the American mythology of Manifest Destiny, the West and the Frontier." As Light points out, the Apollo photographs "radically changed the way humans conceive of themselves in the universe, forever. We thought Apollo was about going to the moon—and it certainly was—but its most enduring legacies are all about the Earth."

Light's textless, cinematic book Full Moon, featuring 57 black-and-white and 72 color photographs and an afterword by the artist, accompanies the exhibition. Published in June 1999 in hardcover by Knopf and in seven additional languages worldwide, Full Moon will be available at the SFMOMA Museum Store.

The San Francisco Museum of Modern Art is a private, not-for-profit institution supported by its members, individual contributors to Donor Circle, corporate and foundation support, federal and state government grants, and admission revenues.

Annual programming is sustained through the Grants for the Arts/San Francisco Hotel Tax Fund.

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# NASA Honor Awards

## '99 Presidential Rank and NASA Honor Awards ceremony held

The 1999 Presidential Rank and NASA Honor Awards Ceremony for Ames Research Center was held on July 13 in the Main Auditorium in Bldg. N201.

Ames presented Presidential Rank and NASA Honor Awards to 25 employees who were selected for individual awards and to the managers of the 7 groups which were selected for the NASA Group Achievement Award. The names of the honorees are listed below. For more information you can visit the Ames Incentive Awards Program web site at <http://huminfo.arc.nasa.gov/Awards/Honorary.html>.

### Presidential Rank of Distinguished Executive

James O. Arnold

### Presidential Rank of Meritorious Executive

David D. Morrison

### Exceptional Engineering Achievement Medal

Jeffrey D. Bull

### Outstanding Leadership Medal

Carol W. Carroll  
Kenneth M. Ford  
Harry W. Gobler  
Sandra G. Hart  
G. Scott Hubbard  
J. Victor Lebacqz  
Meyya Meyyappan

### Exceptional Achievement Medal

Sylvia A. Cox  
James A. Franklin  
Kelly J. Kasser  
Siamak Yassini-Fard

### Exceptional Service Medal

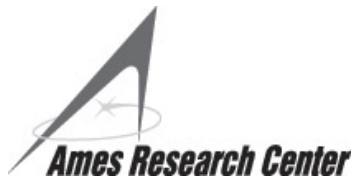
Edwin F. Erickson  
Doris M. Furman  
William S. Hindson  
Gail E. James  
Frances R. Jonasson  
Kristina A. Robles  
Randy D. Rodrigues  
Cdr. James G. Scott, USN

### Public Service Medal

Thomas A. Dougherty  
Lynne J. Engelbert

### Exceptional Scientific Achievement Medal

Jeffrey N. Cuzzi



*photos by Tom Trower*

*Exceptional Achievement Medal winner Sylvia A. Cox (center) chats with colleagues at the awards ceremony.*



*Outstanding Leadership Medal winner J. Victor Lebacqz (center w/notepad) talks to well wishers.*

### Group Achievement Award

1998 Ames-Moffett Flood Response Team  
Ames Major Wind Tunnels and Simulators  
ISO Implementation Working Group  
Aviation Performance Measuring System Research  
Project Team  
Lunar Prospector Team  
Neurolab Project Team  
Slender Hypervelocity Aerothermodynamic  
Research Probe-B1Flight Experiment Team  
Tilt Rotor Aeroacoustic Model Duits-Nederlandse  
Wind Tunnel Team



## Calendar

**Ames Bowling League** will be starting the 99/00 season at Palo Alto Bowl every Tuesday at 6pm on Sept. 7. The season is 33 weeks long and ends April 25 with a banquet the week after. The league is in need of bowlers to join teams, as well as substitutes. POC: Mina Cappuccio, mcappuccio@mail.arc.nasa.gov, at ext. 4-1313 or Mike Liu, mliu@mail.arc.nasa.gov, at ext. 4-4357.

**Ames Ballroom Dance Club. Tuesdays: Salsa 7/27, 8/3, 8/10, Hustle 8/17, 8/24, 8/31.** 3 levels of classes, from Beg. to Int., 5:15 - 6:45pm. Moffett Training and Conference Center, Bldg. 3/Showroom. Women dancers are especially encouraged to join. POC: Helen Hwang, hwang@dm1.arc.nasa.gov. ABDC Website: <http://abdc.arc.nasa.gov/>

**Model HO/HOn3 Railroad Train Club at Moffett Field** invites train buffs to visit and join the club in Bldg. 126, across from the south end of Hangar One. The club is in particular need of low voltage electricians and scenery builders and maintainers. Work nights are usually on Friday nights from 7:30 p.m. to 9:30 p.m. Play time is Sunday from 2 p.m. to 4 p.m. For more info, call John Donovan at (408) 735-4954 (work) or (408) 281-2899 (home).

**Jetstream Toastmasters**, Mondays, 12 noon to 1 p.m., N-269/Rm. 179. Guests welcome. POC: Jenny Kahn at ext. 4-6987 or Karen Matsuoka at ext. 4-6184.

**Ames Child Care Center Board of Directors Meeting**, Wednesdays, 12 noon to 1 p.m., N-213/Rm. 204., POC: Debbie Wood at ext. 4-0256.

**Ames Contractor Council Meeting**, Aug 4, 11 a.m., N-200 Comm. Rm. POC: Jack Stanley at ext. 4-2345.

**Environmental, Health and Safety Monthly Information Forum**, Aug 5, 8:30 a.m. to 9:30 a.m., Bldg. 19/ Rm 1078. POC: Linda Vrabel at ext. 4-0924.

**Hispanic Advisory Committee for Employees**, Aug 5, 11:45 a.m. to 12:30 p.m., N-241/Rm 237. POC: Mary R. Valdez, at ext. 4-5819.

**Ames African American Advisory Group Meeting**, Aug 5, 11:30 a.m. to 12:30 p.m. POC: Robert Finnie at ext. 4-5230. Contact Robert for meeting place.

**Nat'l Association of Retired Federal Employees, San Jose Chapter #50, Meeting**, Aug 6, at the Elk's Club, 44 W. Alma Avenue, San Jose. Social hour: 10:30 a.m. Prog. & bus. mtg. follow lunch at 11:30 a.m. POCs: Mr. Rod Peery, Pres., (650) 967-9418 or NARFE 1-800-627-3394.

**Professional Administrative Council (PAC) Meeting**, Aug 12, 10:30 a.m. to 11:30 a.m. Location TBD. POC: Janette Rocha, ext. 4-3371.

**Ames Sailing Club Meeting**, Aug 12, 11:30 a.m. to 1 p.m., N-262/Rm. 100. POC: Greg Sherwood, ext. 4-0429.

**NFFE Local 997 Union General Meeting**, Aug 18, noon to 1 p.m., Bldg. 19/Rm. 2017. Guests welcome. POC: Marianne Mosher at ext. 4-4055.

**Ames Asian American Pacific Islander Advisory Group Meeting**, Aug 19, 11:30 a.m. to 1 p.m., N-241/Rm. B2. POC: Daryl Wong at ext. 4-6889 or Brett Vu at ext. 4-0911.

**Ames Amateur Radio Club**, Aug 19, 12 noon, N-260/ Conf. Rm. POC: Mike Herrick, K6EAA at ext. 4-5477.

**Native American Advisory Committee Mtg**, Aug 24, 12 noon to 1 p.m., Ames Café. POC: Mike Liu at ext. 4-1132.

**Safety and Quality Week**, October 12-15. Kick-off with Dr. Harry McDonald, Quality Forum co-sponsored with American Society for Quality, Street Fair, Chili Cook-Off, Training and Apollo 13 Commander Jim Lovell. POC: Judi Martelli, ext. 4-2785 or Bob Navarro, ext. 4-5640.

## Ames Classifieds

Ads for the next issue should be sent to [astrogram@mail.arc.nasa.gov](mailto:astrogram@mail.arc.nasa.gov) by the Monday following publication of the present issue and must be resubmitted for each issue. Ads must involve personal needs or items; (no commercial/third-party ads) and will run on space-available basis only. First-time ads are given priority. Ads must include home phone numbers; Ames extensions and email addresses will be accepted for carpool and lost and found ads only. Due to the volume of material received, we are unable to verify the accuracy of the statements made in the ads.

### Housing

Furnished room. Share bath/kitchen/garden/laundry. Easy transport: bus/train + El Camino + H101/237/85 + Central Expressway. Rent: \$560/mo. Call (650) 969-3932 or email at: [solemate@best.com](mailto:solemate@best.com)

Available immediately: For commuter and/or intern; a semi-private temporary space in the same location as above. Weekly \$100 (+ one month). Call (650) 969-3932 or email at: [solemate@best.com](mailto:solemate@best.com)

Master bdrm available in Mt. View. Large apartment of professional lady; El Camino & Rengstorff. Gated bldg w/pool; convenient to bus 20 mins to downtown Palo Alto. Safe \$750. Fontella (650) 962-8411.

English post-doc at Ames needs room to rent, must be near transportation. Dates needed: Sept 6 to Nov 23 (possibly longer). Email: [oliver.de\\_peyer@virgin.net](mailto:oliver.de_peyer@virgin.net) Fax: 01144 118 9316671.

New Ames postdoc arriving July 10, seeks "affordable" rental (rental/share) near Moffett. I'm clean, easy to live with. Reply to: [scottm@darkwing.uoregon.edu](mailto:scottm@darkwing.uoregon.edu) or call (831) 338-1286.

Apartment for rent: 2 bd/1ba in Sunnyvale fourplex, just 3 miles from Ames. Remodeled kitchen, new paint, carport with extra storage. Available now for \$1,060/mo. Call (408) 292-4519.

Room for rent: Share 4bd/2ba home in N San Jose Berryessa Area. 12 mls from Ames. Responsible N/S professional. \$450/mo + dep + util Avail. August. 1. Kevin (408) 259-7684 Lv Msg.

Rental house wanted. Couple with three month old child seeks rental house or apt. in the greater Bay Area for two months (this August and September). Ideal location in SF or Berkeley, but South Bay also considered. Lisa (650) 843-5315.

### Transportation

'86 Blue Ford Mercury (Marquis) stationwagon. Very good condition, new tyres, excellent air conditioning, cruise control, power windows. \$650 or \$790 with two near-new mountain bikes. Call (650) 961 2283 or email [snevetts@hotmail.com](mailto:snevetts@hotmail.com)

'89 Harley-Davidson 883 Hugger (Sportster). Perfect condition. Metallic blue. Custom pipes, chrome, seat, windshield. 10,200 mls. 2 HJC helmets included. \$4,950. Call (650) 969-5581.

'89 Ford Taurus LX, 4dr/sedan, 3.8V6, 107K mls, Loaded: A/C, pwr. steering, windows, seats, locks, premium sound system, leather seats, cruise control, and more. New automatic trans! Excellent condition, runs great, recently smogged. \$3,850 or B/O (blue book ~\$4,900). Magnus, email: [pmn@iau.dtu.dk](mailto:pmn@iau.dtu.dk) or call (650) 857 9069.

'89 Honda Accord LXi coupe, 5 spd., lthr. Int., tinted windows, CD player (10 CD changer), excellent condition, \$4,950. Call (408) 378-2188.

'90 Ford Ranger 4x4 pick-up. 110K mls. Silver. New paint and new 30: tires. Excellent condition. \$4,450. Call (650)969-5581.

'91 Ford Probe, 6 cylinder, white, grey interior, exc. cond., good for student, new tires/brakes, 93,000 mls, \$4,200 or B/O. M. Moore (408) 739-5373.

'92 BMW 325is. 120K mls. Black. Outstanding luxury sport sedan in excellent condition. New Pirelli tires. \$13,150. Call (650) 969-5581.

'92 Honda Shadow 1100cc, great condition, low miles bags, shield, matching helmet included \$4,000 or B/O. Rudy/Sonya at (408) 842-3419.

'92 Honda Accord LX, excellent condition, original owner, loaded, only 35,000 mls. \$12,800. Nita (408) 452-7317 days, or Jeff (408) 729-4402 eve.

'93 Toyota Corolla DX, 102K mls, \$7,500 or B/O. Exterior color - white; interior color - dark gray. Air conditioning, driver air bag, cassette player, automatic transmission, in great condition. Fiona (408) 245-5160.

'94 Honda Civic EX, 4 door, 5 speed, PW, PL, cruise, 70k mls, well maintained and runs great! \$7,500. Call (831) 438-8727.

'94 Corvette, 6-speed, air conditioning, leather seats (driver power seat), am/fm bose stereo, power locks/windows, excellent condition, garaged and well maintained, 40,000 mls. Selling my mid-life crises at \$23,000. Jeff (408) 729-4402.

'95 Mustang GT Convertible. White on white color scheme. Premier stereo AM/FM cassette, leather interior, under 50K mls, PS/ABS/AT, air conditioning. Top of the line Clifford alarm system with interior motion sensor. Excellent condition, Asking \$16,500. Kelly Blue Book retail value over 17K. Have one too many cars and the fun one has to go. Sheryl or Stan (408) 259-4114.

'98 Kawasaki, Concourse. excellent condition, Two windshields included, one stock, one rifle, also includes tank cover. \$6,895. F ranz (408) 927-5648.

### Miscellaneous

HP 350 C Wide Format Ink Jet Color Printer/Plotter \$700, Radio controlled model glider \$185., Digital 10" Radial Arm Saw, Craftsman, \$325, Class 3 hitch with anti sway bars \$295, Video player \$40. Call Stan or Sheryl @ (408) 259-4114

US Robotics Sportster 56K fax modem. Plug and play model 1787/PC. Never used. Original cost \$150. \$50 or B/O. Frank (408) 248-7164.

Motorcycle trailer for 3 bikes, never licensed/ no plates. Great shape. \$285 or B/O. Call (831) 335-4801.

Logitech 400 dpi color scanman for Windows w/ manuals and software, \$20. Call (408) 295-2160.

Weight bench, bar, and 100 lbs of weight; Marcy, Olympic width, incline, and leg extension/curl, \$150. Kelly baby backpack, \$100. 1993 Honda CR 500, \$2,500. Jim (408) 264-0833.

Furniture: bedroom set, almond/ivory color 1 dresser, 2 nightstands \$389; large dresser \$199; 6 formal dining room chairs, almond/ivory color \$299; solid wood dining room table \$399; stereo cabinet, black \$29. Rob (510) 795-9718 or check out at <http://members.home.net/olstad/furniture.html>

Knitting classes start in September in Saratoga. Call Leigh at (408) 867-5010 for info.

Wanted: NordicTrack machine for fitness exercise. Marion Hansen (408) 252-8609.

Ping pong table with paddles in good condition. \$50. Call (408) 847-9106/Gilroy

1/2 HP garage door opener with remotes \$20; oak bath vanity w/corrian bowl B/O; exercise bike \$30. All items in great condition. Eric or Deb at (650) 424-8138.

Kirby Generation 4 vacuum with all attachments. New \$1,300. Asking \$750 or B/O. Call (831) 335-4801.

Mac Quadra 800, 32 MB Ram, OS 8, 1 GB HD, 13" RGB Monitor, extended keyboard, 250-Watt UPS, \$300/ B./O. Peter (650) 941-7957 after 6 p.m.

8 ft. persimmon colored couch, exc. cond. \$175, 2 burnt orange barrel chairs, exc. cond. \$45 each, teak dining room table with 4 chairs, gd. cond. \$200, and more. Call (408) 255-8362.

### Vacation rental

Lake Tahoe-Squaw Valley Townhse, 3bd/2ba, balcony view, horseback riding, hiking, biking, golf, river rafting, tennis, ice skating, and more. Summer rates. Call (650) 968-4155, [DBMcKellar@aol.com](mailto:DBMcKellar@aol.com)

San Juan, Puerto Rico, 3 bdrm ocean side apartment. School headmaster wishes to trade for a 3-4 bedroom home/apartment in the Menlo Park/Palo Alto area for Dec 21, 1999 -Jan 7, 2000 inclusive. Joe (650) 696-6119 or Russ (787) 726-5745 or email [rbeeher@caribe.net](mailto:rbeeher@caribe.net)

# Soccer fever continues at NASA

Whether you're a diehard soccer fan, a Soccer Mom putting together an outing for your team, or just Dear Ol' Dad looking for affordable family entertainment, the NASA Day with the San José Clash is for you!! Join us for some major league soccer when San José meets the Los Angeles Galaxy. The thrill of a San José game makes a perfect setting for our NASA event. We are pleased to bring you a special price of \$5.00 per person (subsidized by the Exchange). The tickets are normally \$7.00 to \$13.00 for these seats.

Date: Saturday, August 7  
Time: 7:30 p.m.  
Place: Spartan Stadium  
Cost : \$5.00 per person  
(additional fee for stadium parking)

Tickets are now on sale at the Ames Café (Bldg. 235), the Gift Shop (Bldg. 223) and the Exchange Office in Bldg. 19, Rooms 1013 and 1014.

If you have any questions, please call Sherry Peters at ext. 4-5969 or Deborah Renick at ext. 4-0290.

# NASA photographs land at San Francisco Museum of Art

*continued from page 5*

Hours: Open daily (except Wednesdays) 10 a.m.–6 p.m.; open late Thursdays until 9 p.m.; closed Wednesdays and the following public holidays: Fourth of July, Thanksgiving, Christmas, New Year's Day

Admission prices: Adults \$8; seniors (62 years and older) \$5; students with valid ID \$4. New admission prices effective July 1, 1999: Adults \$9; seniors \$6; students \$5. SFMOMA members and children twelve and under are admitted free. The first Tuesday of each month admission is free. Thursday evenings, 6–9 p.m., admission is half price.

SFMOMA is easily accessible by MUNI, BART, Golden Gate Transit, SamTrans, and Caltrain. For information, call (415) 357-4000.

Visit their website at <http://www.sfmoma.org> or call (415) 357-4000 for more information



*photo by Tom Trower*

Ames' Center Director Dr. McDonald and Deputy Director Dr. William Berry lend their signatures to a safety banner during a Committee room celebration.

## THE AMES *Astrogram*

The Ames ASTROGRAM is an official publication of the Ames Research Center, National Aeronautics and Space Administration.

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