

## Ames thrives despite NASA budget hardships

— McDonald accepts Administrator's challenge to lead Center forward

On July 7, Ames' Center Director Dr. Henry McDonald delivered his annual assessment of the "State of the Center." While his message contained a few eyebrow-raising moments, for the most part it was music to the ears of a workforce still nervous from years of government downsizing and threats to the very existence of the Center.

McDonald spoke highly of Ames research efforts and role as a technology provider. Overall, "we have made a great deal of progress in becoming accepted as a critical contributor to a number of the key programs within the Agency," he said. Best of all — "some of these programs seem destined to become the basis of the NASA of the next millennium."

McDonald focused his remarks in three areas where major growth is expected, and in which Ames enjoys NASA lead management responsibility — air traffic management, astrobiology and information science and technology. Before discussing these areas, he took time to acknowledge a number of important institutional achievement by Ames this year.

The stunning success of the ISO certification audit proved conclusively that "Ames can do management process," McDonald said. It demonstrated that this can never be offered as the "grounds to withhold mission-related responsibility from us." Further, he said, Ames' safety record of going in excess of one year without a lost-time accident is the envy of the Agency.

McDonald raved about the progress being made in bringing in external parties like Stanford University and the University of California system to be our full partners in collaborative research in support of the NASA mission. We can now view Moffett as "the Ames endowment," he said. In addition, he spoke with pride of Ames' upcoming 60<sup>th</sup> anniversary; the creation of the Ames Hall of Fame and the induction of its first class of twelve honorees; and the selection of two distinguished researchers, Heinz Erzberger and Charles Bauschlicter, to join

the ranks as Ames Fellows.

In the area of air traffic management, McDonald praised Ames' role in "providing a suite of computer-based programs" that will assist the FAA and its controllers in managing the system more safely and efficiently, even with the anticipated increase in air traffic over the next few years. In

welfare." However, McDonald said, cuts in the aero budget and the reduced availability of program support funds have serious implications, even at Ames. They may well force the Center to "stand down" a major facility, like the 12-foot pressure wind tunnel, and face the prospect of further cuts in the rotorcraft program. And this may happen despite the outstanding performance of Ames' personnel in these areas, McDonald fears.

Turning his attention to the space side of the house, McDonald observed that "it now seems clear that Astrobiology will be the defining mission of NASA for the future." He reiterated the importance of Ames role as "both the designated and de facto lead for the Agency" in this important area. He spoke of Ames' accomplishments in establishing the virtual NASA Astrobiology Institute and looked to the creation of a major new facility, the Astrobiology Research Laboratory, "a new purpose-built building" to be constructed as part of the Moffett development process over the next few years.

"Information science and technology," McDonald observed, "is clearly the ubiquitous program enabler across the Agency." In this arena, he spoke of Ames' accomplishments in using neural net software in a variety of ways — from assisting damaged aircraft on Earth to monitoring, reprogramming and flying deep space missions.

continued on page 6



photo by Tom Trower

Center Director Dr. Henry McDonald shares a light moment with the audience during a question and answer session.

particular, he cited the Center Tracon Automation System, the Final Approach Spacing Tool, the Surface Movement Advisor and the "Direct To" tool as being particularly valuable.

"These tools are expected to save the nation's carriers billions of dollars annually by reducing delays and increasing system capacity without compromising safety," he said. He also praised the collaboration between the aeronautics and information system directorates that resulted in the creation of the Surface Development and Test Facility (or virtual airport tower), soon to be renamed in memory of its proponent Stan Harke.

McDonald acknowledged that Ames has redirected much of its "aero" efforts in light of the diminished support for aeronautics research within Congress and the growing view that it constitutes "industrial



# Ames scientists travel to Spain to return historic treasure

Have you ever heard of a school that teaches its students to perform surgeries and experiments in space? Would you have even thought of a doctor trying to catch a flying scalpel? Probably not! But that is exactly what two young, energetic and talented crew trainers taught astronauts to do here at Ames.

About two years ago, Alexandra Branson and Justine Grove, two Lockheed Martin scientists, were assigned to Neurolab, a NASA research mission dedicated to the study of the nervous system. Fifteen Neurolab investigators had designed scientific experiments to find out how gravity affects the nervous system. Alexandra's and Justine's job was to develop procedures and teach them to the astronauts so they could conduct the experiments and collect the scientific data needed to successfully complete the study--regardless of the unusual microgravity environment.

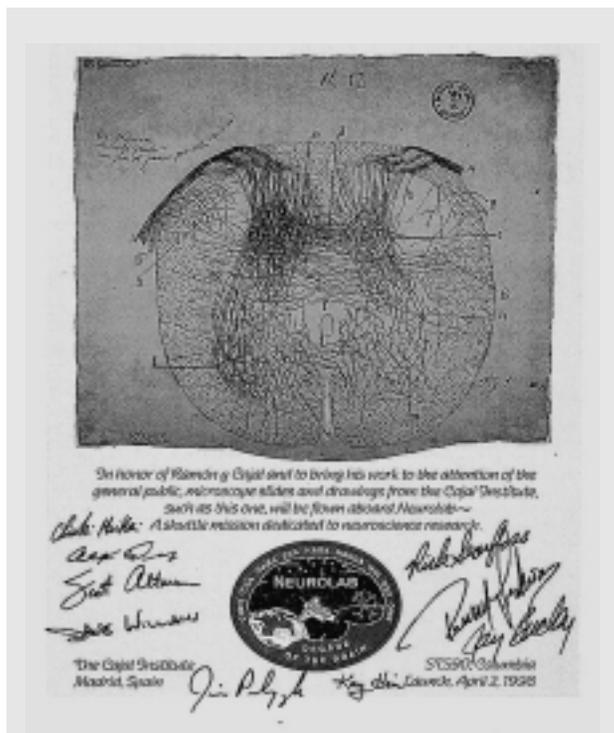
They had seven astronauts to explain 15 experiments to seven scientists to instruct on the performance of complex experiments in a very unusual setting. Since they

had never flown themselves, the experience of others and their own imagination became the textbook for the crew on how to operate with no gravity present. And there is no doubt that working in this laboratory demanded unique training. While everybody worked really hard, the training process was also very enjoyable. It is not often that two young and eager biologists get an opportunity to work with highly skilled professionals on material that will go into space.

Two years of Alexandra's and Justine's extremely intensive work were eventually appreciated, not only by the crew members and investigators in their own country, but even by the Spanish crown. NASA's Neurolab mission had become a successful continuation

of something that started a century ago by Santiago Ramon y Cajal, a Spanish scientist who made the first neurological slides that depicted individual neurons as the building components of the nervous system. These slides were given by the "Ramon y Cajal" Institute of Neurobiology of the Spanish Council for Scientific Research (CSIC) to NASA's Neurolab mission to fly in space as a symbol of scientific progress in this field. The presence of the historic Cajal slides added to the crew's confidence and pride in what they were working on and for what had been achieved. This piece of neuroscience history became sort of a lucky charm for the space researchers.

Once the mission had been successfully completed, Kerry Walton, the Neurolab investigator who initiated the idea of taking the slides in space, got an invitation from the Spanish Council for Scientific Research to bring the treasure back home and present it to the King. Alexandra and Justine gladly joined the Neurolab crew as they traveled to the "Ramon y Cajal" Institute of Neurology in Madrid.



Certificate of achievement honored to the Neurolab mission by the Cajal Institute with the depiction of the historic Cajal slide.



Crew trainers Alexandra Branson (left) and Justine Grove (right) outside of the Institute of Neurobiology in Madrid in the company of Ricardo Martinez Murillo (center), Director of CSIC who sponsored their NASA trip to Spain.

"Our visit was a little over a week. We attended many dinners and social events in celebration of Neurolab," remembers Justine. The excitement about the event was everywhere.

"The King showed his great interest in NASA activities and spoke for a long time with all the crew members," said Dr. Garcia-Segura. Dr. Garcia-Sagura also emphasized the great importance of the collaboration between Spanish scientists and NASA researchers and reinforced the Spanish public's interest in NASA activities. After returning the Cajal slides to Juan Carlos I and Her Majesty, the Spanish Minister for Science and Education presented NASA with the gold medal for its contribution to neuroscience.

"The audience with the King of Spain and the gold medal award to NASA from the CSIC are two good examples of the success of this visit," says Dr. Javier DeFelipe of CSIC. "This event is very important because it represents a unique opportunity to make neuroscientists' work known beyond the world of neuroscience."

Enjoyment and satisfaction with a job well done fulfilled the hearts of NASA astro-

*continued on next page*

# Space settlement contest award winners tour Ames

More than 80 students, teachers and parents spent Monday, June 21 touring Ames.

The students were award winners in the sixth annual Space Settlement Design contest. This year's contest drew 258 submissions from over 900 students with guidance from 34 teachers. Entries came from Canada, India, Jordan, Macedonia, Pakistan, Peru, Spain and the United States. For details on the 1999 contest see: <http://science.nas.nasa.gov/Services/Education/SpaceSettlement/Contest/Results/99/>

The tourists were engaged in learning activities in both the Ames Ames Aerospace Encounter and Space Camp California in the morning. Afternoon visitations included stops at the Space Station Biological Research Project mockup, the Lunar Prospector control room, the NFAC wind tunnel, the Crew Vehicle Systems Research Facility, and the NAS visualization lab and computer room.

Participating student groups came from Canada, Florida, New Jersey and California, including 6th-12th grade students worldwide.

Credit goes to all Ames volunteers who provided support in making this an exciting and unique educational experience for all of the tourists.

Grades 6-9 and 10-12 were judged as separate categories, except for the grand prize. The students developed space settlement designs and related materials and then submitted them to Ames for judging. Many teachers used the contest as an instructional thematic in their science curriculum. It not only promotes team building, but this project-web based learning tool also allows teachers a vehicle to address national science standards.

Space colonies are seen as permanent communities in orbit, as opposed to living on the Moon or on the other planets. The work of Princeton physicist Dr. O'Neill and others have shown that such colonies are technically feasible, although expensive. Settlers of this high frontier are expected to live inside large air-tight rotating structures holding hundreds, thousands or even millions of people along with animals, plants and single celled organisms vital to comfort and survival. There are many advantages to living in orbit; zero-g recreation, environmental independence, plentiful solar energy, and terrific views to name a few.

There is plenty of room for everyone who wants to go; the materials from a



*Space Settlement design contest award winners pose alongside a Shuttle model outside the Ames Visitor Center.*

single asteroid can build space colonies with living space equal to about 500 times the surface of the earth.

Entries for next year's contest will be due on March 31, 2000. Encourage your children and teachers to participate. Materials that support space settlement design

activities may be found at: <http://science.nas.nasa.gov/Services/Education/SpaceSettlement/>

The contest and related web page are funded and operated by Code IN (NAS).

BY BRYAN YAGER 

# Ames's scientists Travel to Spain to return historic treasure

*continued from previous page*



*Neurolab crew and biologists enjoy the festivities during the visit to the University of Madrid.*

nauts and scientists and their Spanish colleagues as well. The Spanish minds, on the other hand, were most affected by the professionalism of NASA's specialists: "I was impressed by their technical skills and scientific knowledge, and they left a very good impression here in Spain," says Dr. DeFelipe.

Such recognition of Neurolab's accomplishments were extremely gratifying for Alexandra and Justine, our crew trainers who devoted so much effort and time to ensure Neurolab's success. So, while everybody bows to the King, we take our hats off to them for the great job they have performed.

BY VICTORIA KUSHNIR 

# Ames has major interest in STS-93 Shuttle mission

Ames played several important roles in the STS-93 shuttle mission, the first shuttle mission commanded by a woman, Col. Eileen Collins, United States Air Force. Ames' involvement in the mission included a life science experiment, a technology demonstration, crew training and an education program. In addition, one of the outstanding STS-93 crewmembers, Steven Hawley, served as the Associate Director of NASA Ames from 1990 to 1992.

The Small Payloads Team from Ames' Life Sciences Division managed the development of Dr. Haig Keshishian's experiment to study the effects of spaceflight on the developing nervous system using genetically engineered fruit flies (see story below). This experiment represents the first time that a species has been specifically designed to fly in space.

The Sensors2000! Team from Ames' Office of Research and Development dem-

onstrated the ability of a tiny biology sensors unit to monitor onboard cell cultures. The new sensor, Biona-C, may serve as a pint-sized "chemistry lab" in future missions (see story next page).

Col. Collins and members of her crew came to Ames to train in the Vertical Motion Simulator (VMS), a state-of-the-art flight simulator. The VMS, operated by Ames' Simulation Experiments Branch, allows astronauts to practice their Shuttle approach and landing skills prior to going into space.

Ames' Quest education program sent three local high school students to KSC for the launch. The students wrote daily online journals to share their experience with others. A follow-up webcast with Eileen Collins is planned – see <http://quest.arc.nasa.gov> for further information.

The primary objective of the mission was to deploy the Chandra X-Ray observatory, designed to observe X-rays from high-



energy regions of the universe. Additional information about the mission can be found at <http://www.shuttlepresskit.com/index.html>.

BY KATHLEEN BURTON

## Ames flies fruit flies on STS-93

It's a remarkable fly that has a glowing nervous system. It's an even more remarkable fly that can orbit the Earth every 90 minutes – especially when it's still larvae, and doesn't have wings! However, that's exactly what 30 thousand genetically engineered fruit fly eggs and larvae did during

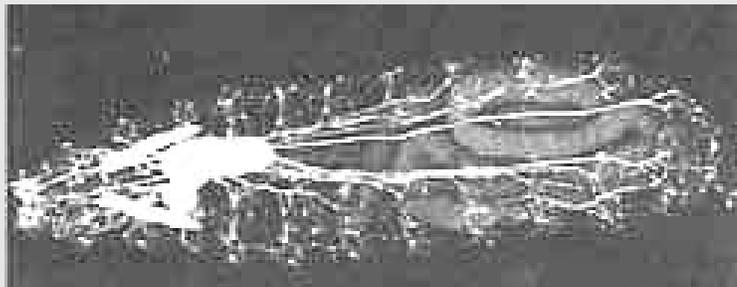
how synapses differentiate and develop to their mature form during embryonic and post-embryonic life. Synapses are the communication junctures between nerves where signals are transferred from one nerve to the other.

One of the challenges for the Ames' small payloads team that managed this experiment was to ensure that the development of the fruit flies' nervous system occurred while the *Drosophila* eggs and larvae were actually in microgravity. This was ac-

phila were once again chilled to stop further development. The *Drosophila* remained chilled until Dr. Keshishian was ready to begin his postflight analyses of their nervous system.

And why did the flies have glowing nervous systems? Well, as you can imagine, fruit fly nerves and synapses are extremely small. To facilitate his analyses, Dr. Keshishian inserted a naturally occurring jellyfish gene – Green Fluorescent Protein – into the *Drosophila*. This resulted in a special line of fruit flies that have nervous systems that glow.

BY LAURA LEWIS



The nervous system of this genetically engineered fruit fly larvae can be clearly seen thanks to a jelly fish gene that makes it glow.

an experiment on the STS-93 mission. The experiment, officially titled "Synaptogenesis in Microgravity (NIH.B1)," was designed by Dr. Haig Keshishian at Yale University to study how microgravity and spaceflight affect the developing nervous system of *Drosophila melanogaster*, better known as the fruit fly. Specifically, Dr. Keshishian was studying how nerves that control movement navigate through the embryonic central nervous system and get to the appropriate muscle fibers they will control; how these motor neurons actually innervate, or attach to their respective muscle fibers; and

completed by flying the experiment in the incubator containment module (ICM) provided through a collaborative agreement between NASA and BioServe, Inc. The ICM is basically a suitcase-sized unit that fits into a Shuttle middeck locker. Within the ICM are eight individually controlled incubators that look something like tennis ball cans. The ICM provided the ability to launch the eggs and larvae at 11°C – a temperature where their development was nearly stopped. Once in space the ICM automatically warmed up to 25°C and development began. Before returning to earth the *Droso-*

## Bill Harper remembered...

William "Bill" Harper passed away on June 12 of this year after a brief bout with cancer. Bill retired in 1988 after 33 years of government service as an instrumentation engineer with the Ames unitary wind tunnel complex. He recently moved to Grants Pass, Oregon and is survived by his wife of 26 years, Diane Harper, and a large family and many loving friends. His wife wishes to thank all their friends for the cards and messages they received during his illness.

## Center Briefs

### **Investigation finds design errors caused WIRE spacecraft failure**

NASA's Wide-Field Infrared Explorer (WIRE) spacecraft failed because of an incorrectly designed electronics box that prematurely fired explosive devices, causing early ejection of the instrument's telescope cover, a NASA board has found. With the premature loss of the telescope's cover, the frozen hydrogen used to cool the telescope's sensitive infrared detectors was exposed to the Sun. As the telescope warmed, the hydrogen converted into a gas and vented entirely into space within 48 hours of launch.

Without the frozen hydrogen, the instrument could not conduct its scientific mission.

### **Mars images to help scientists find landing site for 2001 lander**

One of the original objectives of the Mars Global Surveyor's Mars orbiter camera when it was proposed to NASA in 1985 was to take pictures that would be used to assess future spacecraft landing sites. Images obtained since March provide the highest resolution views of the planet ever seen. Over the past several months, science personnel have been examining the new data to develop a good understanding of what Mars is like at the meter-scale. These investigations will help scientists pinpoint a landing site for the Mars Surveyor 2001 lander.

### **X-34 Rocket plane conducts first captive-carry flight**

Locked to the belly of its newly modified L-1011 carrier aircraft, a test version of NASA's X-34 rocket plane made its first flight June 29 from NASA's Dryden Flight Research Center, Edwards, CA. The prototype of the robotic spacecraft will test new technologies and methods of operations needed to develop low-cost reusable space vehicles. This captive-carry flight, in which the aircraft and test vehicle remained combined, checked for potentially hazardous conditions that may have resulted from modifications made to the L-1011 to enable it to carry the X-34.

### **Third man to walk on Moon dies in motorcycle accident**

Charles "Pete" Conrad, the third human to walk on the moon, died on July 8 in a hospital in Ojai, CA, of injuries sustained in a motorcycle accident. He was 69.

Conrad made history on Nov. 19, 1969, when, as commander of the Apollo 12 mission, he and astronaut Alan Bean set their lunar module "Intrepid" down on the moon's Ocean of Storms, the second of six Apollo landings.

The NASA Administrator remembers Pete Conrad as "one of the great aviators and explorers of the 20th century."

## STS-93 to carry Ames sensors developed in-house

A tiny chemical lab, no bigger than a deck of cards, may evolve from Ames-developed biology sensors device that flew on board the Space Shuttle Columbia when it thundered into orbit on July 20.

"The sensors were developed in-house," said Mike Skidmore, Deputy Manager of the Sensors 2000! an Ames Code F program.

During the STS-93 space flight, Biona-C's sensors monitored acid levels in a cell culture carried on the Shuttle. By combining Biona-C with computer electronics, pumps and valves, Ames scientists are working toward the eventual development of a tiny, automated chemical laboratory.

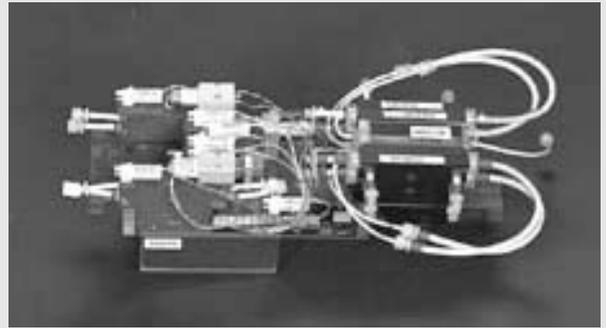
"Project by project, we are making miniaturized parts that will comprise a portable chemistry lab no bigger than a shoebox or a deck of cards -- and maybe even smaller," said Dr. Carsten Mundt, an electrical engineer in the Sensors 2000! program office. "One of our goals is to build smaller and smaller sensors able to make various kinds of physiological, chemical and biological measurements."

During the flight, fluid ran through Biona-C's tubes and across multiple sensors while nourishing the cells. The tubes containing the sensors are mounted on an electronics board to save space. "In our efforts to make a tiny chemical lab, we must put computers, electronics and traditional laboratory hardware into a small package, and we must integrate the parts in new, innovative ways," said Charlie Friedericks, Ames' Biona-C project engineer.

The Biona-C sensors were part of a 'rail' that assists cell growth during space flights. The 12-inch-long rail controls the fluid flow and temperature of the bioreactor cartridges that contain the cells. The Biona-C rail is one of three that were enclosed in a Cell Culture Module inside a locker in the Space Shuttle's mid-deck.

Scientists in Ames' Sensors 2000! group developed Biona-C in cooperation with the Walter Reed Army Institute of Research, Silver Spring, MD. In November 1997, scientists at Ames and Walter Reed outlined requirements for the instrument package in the Cell Culture Module aboard STS-93 designed to measure pH in cell cultures.

The first Biona-C sensors were used in a prototype artificial liver research program to measure concentrations of calcium ions, Ca<sup>2+</sup>, in flowing blood plasmas in a custom instrument called the 'Blood Flow Ion Ana-



*The BIONA-C Rail contains four independent fluid paths that circulate media to support the cell growth. In each fluid path, media flow through a separate bioreactor where fluids transfer across a permeable membrane to the cell culture.*

lyzer' or Biona. Ames' scientists modified the sensors to measure pH in the STS-93 Cell Culture module.

In collaboration with Cedars-Sinai Medical Center, Los Angeles, CA, Ames scientists are continuing to develop sensors and measurement systems for use with an experimental bio-artificial liver under development by private industry and targeted for use by patients awaiting transplants. Doctors at Cedars-Sinai use the sensor to monitor calcium in the external plasma flow and to help control constituent plasma elements.

"The unique integration of fluidics and electronics allows us to have a very-sensitive, low-noise unit that is modular," said John Hines, Ames' Sensors 2000! program manager. "Making smaller 'building-block' modular units will enable us to construct tiny, portable chemistry labs."

In another collaborative project with the Fetal Treatment Center at the University of California, San Francisco, scientists are developing a "pH pill transmitter." This device must be miniaturized and implantable in a woman's womb for up to several months to monitor the condition of her fetus. The pill transmitter will be 10mm in diameter and 35mm long.

Further information can be obtained at the Sensors 2000! program Internet URL: <http://s2k.arc.nasa.gov>

BY JOHN BLUCK

### Beat air pollution this summer!

The arrival of summer time means abundant sunshine, picnics, and outdoor activities. But it also signifies the annual kick-off of the "Spare the Air Day" program. Sponsored by the Bay Area Air Quality Management District, the program promotes the use of environmentally friendly activities on days when the air quality is poor. The program is also designed to educate the public about alleviating key polluting activities.

As you may have guessed, your car is the number one culprit. Statistics estimate that in the Bay Area, cars contribute over 400 tons of air pollution each day! And if that isn't enough, daily use of hairsprays, household cleaners, gasoline-powered lawn equipment, recreational boats, and oil-based paints can pile on an additional 50 tons of pollution per day.

But before you grab an oxygen tank, there are numerous things you can do to improve air quality. Practice trip linking--organize your errands together so that you are not continually restarting your car's engine after it has cooled down. Keep your tires properly inflated, maintain regular tune-ups, and don't "top off" at the gas station.

Furthermore, give your gas-powered lawn mower a break. (Did you know a two-stroke gas-powered lawnmower pollutes the equivalent of 40 late-model cars in just

an hour?). Use an electric-powered motor or borrow a push mower from a neighbor. Use a rake or broom to manicure your lawn. Fire up your barbecue with an electric or chimney briquette starter. Banish your arsenal of aerosol hair products, replacing them with pump sprays. Turn on a fan, instead of an air conditioner.

At Ames, you can prevent air pollution by avoiding driving. Bring your lunch or walk to your lunch destination. Hop on one of the Center's bikes or walk between buildings. Most importantly, commute by using alternative transportation. Check out the "Spare the Air" web site at <http://www.sparetheair.org> for a plethora of transportation links.

Ames is also taking steps to reduce air pollution this summer. The plant engineering branch, Code JFP, will avoid using gas-powered mowers and blowers on non-convective "Spare the Air" days.

This summer, make a conscience effort to do your part to reduce air pollution. There is a Chinese proverb that symbolizes the message of "Spare the Air Day." "If you are thinking one year ahead, sow seed. If you are thinking ten years ahead, plant a tree. If you are thinking a hundred years ahead, educate the people."

BY MICHELLE PERRY



### Ames thrives despite NASA budget hardships

*continued from front page*

He also addressed Ames' important role in "an extended and much more powerful concept of Integrated Vehicle Health Management" that will "reduce operational costs and unscheduled maintenance in addition to enhancing safety." Finally, McDonald praised Ames collaboration with SGI, Inc. in developing a 256-node, supercomputer that doesn't require special handling. Development of the next-generation 512-node machine, now on the drawing board, "will place Ames and the Agency once more in the forefront of scientific computing," he said.

McDonald addressed Ames efforts to get funds to support Astrobiology augmentation and the Intelligent Systems initiative. "Even without these additional funds," he said, "Ames budget, as it stands right now, is relatively flat." Additional funding at the proposed levels would raise the Ames budget by 10%. This is a far cry from the situation faced by many other centers, particularly those with an aeronautics focus. Nonetheless, "with distribution across the Center uneven," McDonald observed, "this will continue to provide pressure for us to redirect elements of the Center and its personnel."

In closing, McDonald reported that, while his current tenure as Ames' Center Director under an Inter-Agency Personnel Agreement will expire soon, he has agreed to accept NASA Administrator Goldin's request that he remain as Ames' permanent Center Director. He said that, working together with the Ames staff, he foresees "a wonderful, exciting, critical role for ourselves in support of this nation's aerospace program."

"I believe that, with your continuing support, this success will continue," he said. However, the Ames workforce must remain vigilant and keep pushing forward. The success that has been achieved was "hard won and hotly contested," he said. "To retain our position, we have to continue to perform at a very high level. Other talented groups covet our role. We must invite them to join with us at the table, but be careful that we do not become the meal," he said.

BY DAVID MORSE



### The Full Moon exhibition programs to be held at SFMOMA

Full Moon: Apollo Mission Photographs of the Lunar Landscape opens at the San Francisco Museum of Modern Art on August 20 and will run through January 4, 2000.

- August 27 at 11 a.m. - Mike Light and photography department curator Sandra Phillips will have a dialogue about the show in the Phyllis Wattis theatre as part of the "Art in Conversation" series--this is an informal dialogue structure/introduction to the show, with ample time for audience questions.
- October 4 - Gene Cernan and Andy Chaikin will be at the museum for their "Free Tuesday" program--time TBA--educational outreach.
- October 14 will be the reception for the show in the Charles Schwab Room in the evening, on a Thursday night when the entire Museum stays open late.
- November 4 - Mike Light will give a solo evening artist's lecture in the Phyllis Wattis theatre on the show, cosponsored by San Francisco Camerawork. This will be directed towards the concerns of a somewhat knowledgeable, art-oriented audience--the hardcore visual and landscape people.

The key coordination person at the museum is Polly Winograd, public relations manager. Her email is: [pwinograd@sfmoma.org](mailto:pwinograd@sfmoma.org). Her phone number is (415) 357-4173. You can also contact Gail Indvik in Outreach and Educational Programming at (415) 357-4922. The address for the museum is 151 Third Street, San Francisco.

# Events & Classifieds

## 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: Rumba 7/13, 7/20, Salsa 7/27, 8/3, 8/10. 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/HO3 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 Multicultural Leadership Council Meeting,** Jul 21, 11:30 a.m. to 1 p.m., Galileo Rm/Ames Café. POC: David Morse, ext. 4-4724 or Sheila Johnson, ext. 4-5054.

**NFFE Local 997 Union General Meeting,** Jul 21, noon to 1 p.m., Bldg. 19/Rm. 2017. Guests welcome. POC: Marianne Mosher at ext. 4-4055.

**Turning Point,** a program that matches adult mentors with teens, is looking for new mentors. The Program is about being a role model, a friend, and a coach. You will make a difference in the next generation of leaders and citizens. The training provided will also make a difference in your personal and professional life. To learn more about Turning Point, come to the presentation on July 22, at 12:00 noon - 1:00 in N213, room 261. For info, contact Steve, ex 4-4214, or Carmen Steinberg at (408) 294-0500 ex 14.

**Native American Advisory Committee Mtg,** Jul 27, 12 noon to 1 p.m., Ames Café. POC: Mike Liu at ext. 4-1132.

**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,** no July meeting; next meeting is 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.

**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.

## 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.

Room for rent in shared 3bd/2ba Mt. View townhouse; 2 car garage, patio, quiet area. \$600/mo; Rich or Aaron at (650) 968-2478.

Room for rent in Santa Clara home. Near Pruneridge and San Thomas Expwy. Own bath, kitchen and laundry privileges. \$550/mo. Call (408) 248-1667.

Available immediately: 1bd apt. one mile from Moffett. No pets. \$800 a month. Call (650) 965-0775.

Room for rent in 2 bed apt., shared housing, \$550/month + utilities. 5 min from Ames. Available after July 5. Dave (650) 962-0719.

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.

New Ames postdoc arriving July 10, seeks "affordable" housing (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.

### Transportation

'86 VW Cabriolet, 5 speed transmission; dark grey metallic color, new top, air conditioner, 92,000 miles, maintained well. \$3,500 or B/O. Call (650) 948-4678.

'86 Honda Accord Lxi, Hatchback, 156K mls, automatic transmission, air conditioning, reclining seats, cruise control, tilt wheel, power windows, mirrors, steering, brakes. Exc. cond. \$2,650. Bill (408) 744-9132.

'88 Toyota Corolla blue, 4 dr sedan, 5 speed, 133K mls, exc. cond., orig. owner. \$3,100 or B/O (blue book is \$3,600). Call Jackie Signor (650) 723-7421 (W); (408) 733-5028 (H).

'97 Honda Civic EX, immac. white cpe, 5 spd, 35K mls, well kept & maint, must see \$12,500. Call (650) 851-5290

'98 Honda Prelude (bought April '98), 2.2 Liter 4-CYL Engine, 4-SPD automatic transmission. White diamond exterior, black interior: 16" chrome alloy wheels, power sunroof, A/C, AM/FM/CD sound system w/anti-theft feature, keyless alarm system. Excellent condition, need bigger car. 20,000 mls, \$20,000. Patty (408) 308-9417.

### Miscellaneous

Roll top desk, solid, dark wood, must sell-moving. \$400. 54 1/2 long; 28 3/4 wide; 45 tall. Helen (408) 586-9107.

Ski/fishing boat. 15.5' Glasspar with an 85 horse Johnson outboard motor. New floor, seats, ignition, trailer bearings and trailer lights. Needs a little work. Asking \$1,100 or B/O. John (408) 749-1015.

EvenFlow stroller; very clean, dark blue/white, \$35. Call (408) 295-2160.

Car stereo: AM/FM/Dolby cassette/CD changer control/anti-theft with 4x20W power, from new car. \$40. Call (408) 295-2160.

19" Color TVs - one used exc. condition \$40, one new in factory sealed box \$120. Nans (510) 790-3506.

Tent, family, 6-person, screen windows and doors, canopy and ground tarp, good condition, will deliver, \$50 or B/O. Call (707) 546-0898 or email [mascy@jps.net](mailto:mascy@jps.net)

Radio-controlled Victoria racing sloop: ready to sail, includes radio & stand. \$150 or B/O. Call (650) 969-0787.

Apple 17-inch color monitor, model 1705, \$200. Antique Mahogany desk, \$250 or B/O. Call (408) 378-8633 or email at: [rgj@slip.net](mailto:rgj@slip.net)

Kendon folding dirt-bike trailer w/spare tire. Registered 'til June 2000, \$500. Slide-in pop-top camper for long bed mini truck. Four wheel camper w/all options \$4,000 or B/O. Pickup shell for long bed mini truck. Toyota #33 white, broken window \$50, Bill (650) 691-9636.

### Vacation rental

Lake Tahoe-Squaw Valley Townhse, 3br-2ba, Balcony view, horseback riding, hiking, biking, golf, river rafting, tennis, ice skating, and more. Summer rates. (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. Call Joe (650) 696-6119 or Russ (787) 726-5745 or email [rbeeche@caribe.net](mailto:rbeeche@caribe.net)

Luxury vacation rental in Tahoe Donner. New custom 3,000 sq ft, 4 bedroom, 4.5 bathroom house with contemporary amenities, cathedral ceilings, and spectacular panoramic views. Multiple dual-phone jacks installed for phone and computer connectivity. Call (800) 805-8199, send e-mail to [tmvrs@telis.org](mailto:tmvrs@telis.org), or get more info at <http://www.tmv.com/>

Vacation rentals from Intervals International book of vacation spots, Five Star rentals, In unit meal preparation, 4 week available, \$700.00 a week. Ben or Marilyn (408) 274-5474 or [bmsteale@best.com](mailto:bmsteale@best.com)

### Lost & Found

Moffett Field Lost and Found may be reached via ext. 4-5416 at any time. Residents and employees at Ames may also use Internet Browser at: <http://ccf.arc.nasa.gov/codeip/pages/lostFound.html> to view a list of found property and obtain specific instructions for reporting lost or found property and how to recover found property. Call Moffett Field Security Police Investigations Section at ext. 4 1359 or email at: [mfine@mail.arc.nasa.gov](mailto:mfine@mail.arc.nasa.gov).

### Astrogram deadlines

All Ames employees are invited to submit articles relating to Ames projects and activities for publication in the *Astrogram*. When submitting stories or ads for publication, submit your material, along with any questions, in MS word by e-mail to [astrogram@mail.arc.nasa.gov](mailto:astrogram@mail.arc.nasa.gov) on or before the deadline.

DEADLINE	PUBLICATION
TUES, JUL 20	MON, AUG 2
TUES, AUG 3	MON, AUG 16
TUES, AUG 17	MON, AUG 30

## Shuttle development conference

Ames will be the sight of demonstrations and discussions of exciting new technologies designed to upgrade NASA's Space Shuttle system during the first Space Shuttle Development Conference to be held at the Center on July 28-31. Jointly sponsored by NASA and the United Space Alliance, Houston, Texas, the Agency's Space Shuttle prime contractor, the conference will include technical sessions, panel discussions, tours of Ames facilities and a static displays.

The Shuttle system still has about 75 percent of its design life remaining. That fact, in combination with tight Government budgets and the relatively slow pace of developing reusable launch vehicles, means that the Shuttle will continue as the nation's primary system for space access for a period of an estimated period of 15 to 30 years. Consequently, NASA has authorized the Shuttle program to allocate \$100 million (to \$300 million) per year to upgrade the system to ensure that it will remain reliable and versatile well into the next century.

Every effort is being made to encourage Silicon Valley businesses to attend the conference to see how they might become a part of the Shuttle program. In addition, Ames technical personnel are invited to consider how the technologies that they develop can be incorporated as part of the Shuttle upgrade program, or how their research might benefit from using the Shuttle as a testbed.

To assist Ames personnel to understand the Shuttle upgrade program, Jeff Jones of Code IC is holding a series of briefings on the program on Thursday July 22 and Tuesday July 27 in the Moffett Training and Conference Center. For those interested, conference registration information can be found at: <http://www.futureshuttle.com>

Ames exhibits will highlight thermal protection systems, spacecraft docking, Mars rover, neural net technologies, aerospace flight simulation, cockpit design, air traffic management, a virtual laboratory, Astrobiology, robotics, rotorcraft and commercial technology. In addition, prominent Silicon Valley companies like SGI, Inc., Sun Microsystems, Apple Computer and Hewlett Packard are making plans to display their technologies. Exhibits from the SETI Institute, KICU-TV Channel 36, Salinas Valley Memorial Health Center, U.S. Space Camp, and Rock-It Science will also be featured.

On July 31, Ames and invited California elected officials will wind-up the event by co-hosting "Space Technology and Education: A Federal, State and Local Partnership" day in Hangar 1. Conference exhibits will be on display to thousands of special guests from 9 a.m. to 2 p.m.

BY MICHAEL MEWHINNEY   
AND DAVID MORSE

## Open forum set

NASA will conduct an open forum meeting to solicit questions, views and opinions of interested persons or firms concerning NASA's procurement policies, practices, and initiatives. The purpose of the meeting is to have an open discussion between NASA's Associate Administrator for Procurement, industry, and the public. The date for this meeting is August 12, from 9:00 a.m. to 11:00 a.m. The meeting will be held at Ames in the Space Science Auditorium, Bldg. N245. For more information, contact Michael R. Basta at ext. 4-4010.

### THE AMES Astrogram

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

Managing Editor.....David Morse  
Editor.....Astrid Terlep

We can be reached via email at:  
[astrogram@mail.arc.nasa.gov](mailto:astrogram@mail.arc.nasa.gov) or by phone  
(650) 604-3347

### THE AMES Astrogram

National Aeronautics and  
Space Administration

Ames Research Center  
Moffett Field, California 94035-1000

Official Business  
Penalty for Private Use, \$300



FIRST CLASS MAIL  
POSTAGE & FEES PAID  
NASA  
Permit No. G-27



PLEASE RECYCLE  
Printed on recycled and recyclable paper with vegetable-based ink.