



# ASTROGRAM

Newsletter of NASA Ames Research Center, Moffett Field, California

September 2007

## NASA maps the moon with Google

New higher-resolution lunar imagery and maps including NASA multimedia content now are available on the Google Moon Web site.

Updates include new content from the Apollo missions, including dozens of embedded panoramic images, links to audio clips and videos and descriptions of the astronauts' activities during the missions. The new content is overlaid on updated, higher-resolution lunar maps. Also added are detailed charts of different regions of the moon suitable for use by anyone simulating a lunar mission.

"NASA's objective is for Google Moon to become a more accurate and useful lunar mapping platform that will be a foundation for future Web-based moon applications, much like the many applications that have been built

on top of Google Maps," said Chris C. Kemp, director of strategic business development at NASA Ames. "This will make it easier for scientists

recently updated lunar coordinate system and can be used for scientifically accurate mission planning and data analysis. The new site is designed to be

user-friendly and encourage the exchange of data and ideas among scientists and amateur astronomers.

This announcement closely follows the release of new NASA content in Google Earth, including photographs taken by NASA astronauts and imagery from NASA's Earth observing satellite sensors, such as the Sea-viewing Wide Field of View Sensor, Landsat and the Moderate Resolution Imaging Spectrometer.

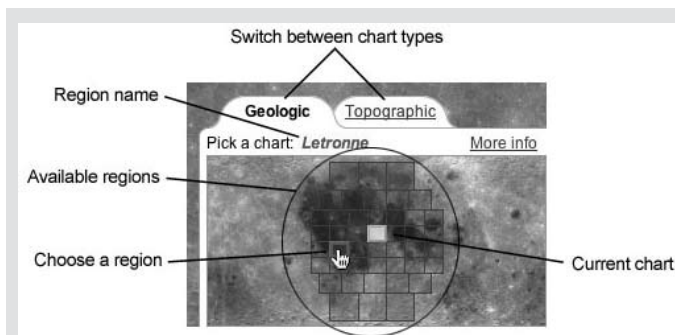
Astronaut photography was developed in collabora-

tion with the Crew Earth Observations team, part of the Image Science and Analysis Laboratory at NASA Johnson Space Center, Houston. Satellite imagery of Earth was developed in partnership with the Earth Observatory team at NASA Goddard Space Flight Center, Greenbelt, Md.

The alliance was accomplished under a Space Act Agreement signed in December 2006 by Google and NASA Ames.

For more information on Google Moon, visit: <http://moon.google.com>  
For more information on Google Earth, visit: <http://earth.google.com>

BY MICHAEL MEWHINNEY



This is an example of the Google Moon charts. To use them, first turn on the 'Charts' layer in Google Moon. Then, pick the chart type and region you want from the panel that appears in the lower right. The geologic charts were produced from the USGS Geologic Atlas of the Moon, and the Topographic charts were produced from USAF/NASA LAC Lunar Chart series.

everywhere to make lunar data more available and accessible."

Google Moon's visible imagery and topography are aligned with the

*To our readers...*

## The Astrogram transitions to Internet

Increasingly, we receive our news and information from electronic sources, namely, television, radio, Internet, e-mail and portable devices. The NASA Ames Public Affairs Office is transitioning from publishing both electronic and printed editions each month to publishing the Astrogram online only. This issue is the last copy of the newsletter in printed form.

The Astrogram has been in existence since October 1958 and has actually been available for download online with issues dating from 1998. The Web site is: <http://www.nasa.gov/ames/astrogram>.

While some may miss the printed

edition, the good news is that 100 percent of the Astrogram's content will be reflected in the Astrogram online. Also, the online version delivers the same news and features about a week earlier than the print version. The newsletter also will be in color.

In addition, publishing the Astrogram online will save approximately \$30,000 and publishing online is environmentally friendly as it saves paper.

The staff of the Astrogram appreciates your continued support and hopes that you will enjoy the new look of the Astrogram.

BY MICHAEL MEWHINNEY

## On the Inside . . .

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## Aurigid meteor shower show dazzles airborne observers

On the night of Sept. 1, 2007, NASA Ames hosted the deployment of two privately owned Gulfstream V

This is the first time that the encounter with the dust trail of a long-period comet has been predicted

longer to return, pushed into a wider orbit by solar radiation, and has been coming back ever since in a continuous, but very thin, stream of dust.

As predicted, Earth was hosed by that dust in the early morning of Sept. 1, 2007, when during a short period of time meteors radiated from the constellation of Auriga, the Charioteer. The shower was seen in most states west of the Mississippi, including Hawaii and Alaska, and from the western provinces of Canada. Some eye witnesses watched the shower in a jacuzzi, or from their bedroom window. Each observed between a handful and several tens of bright and colorful meteors, some with flares and brief trains. More than a 100 observers wrote us about their experiences and so far 53 contributed images of the Aurigids captured with digital cameras. Some of the images are quite spectacular, also because the four-days-past-full-Moon evening nicely lit the landscape that framed the bright meteors in the sky.

Daytime observers in Europe, the eastern USA and Brazil detected the presence of the shower from



photo courtesy of NASA/ESA

NASA Ames hosted a deployment to observe the Aurigid meteor shower on Sept. 1. This is a composite image of the Aurigid shower with 15 Aurigids observed from one of the two aircraft. The meteors span the period 11:04:44 to 11:50:54UT Sept. 1, 2007 (a 46-minute period covering the peak).

jets with an international group of 24 researchers on board to observe the predicted return of the rare Aurigid meteor shower.

The event was caused by the fortuitous collision of Earth with the ever-wandering dust trail of comet C/1911 N1 (Kiess), a potential Earth impactor and a source of debris that might harm satellites in orbit. In other years, that stream of dust particles passes by undetected, just outside or inside Earth orbit, but in 1935, 1986, and 1994 the stream wandered in Earth path and created a brief shower of bright meteors.

The shower was seen by only two observers in 1994 and one observer in 1986. Thanks to the power of foresight, this year thousands were able to enjoy the spectacle.

"This was my daughter's (age 9) first shower and she and her friend were absolutely delighted, asking: 'When's the next one?' Hopefully, we have a new astronomer in the making!," wrote Doug Blasco of California, one of many people who witnessed the meteor outburst.



The Aurigid Multi-Instrument Aircraft Campaign (MAC) research team at NASA Ames.

photo courtesy of NASA/SETI Institute

through modeling. Each meteor was a small time capsule from the year 4 A. D., give or take 40 years, when the comet rounded the sun. Comet and dust moved in a 2000-year orbit far beyond Neptune, all the way into the Oort cloud, before falling back again. The comet returned in 1911 and was discovered by then Lick Observatory post-doc Carl Kiess. The dust took

reflected radio signals while listening for distant radio stations. The shower was very obvious, because there were many long-lasting, overdense echoes during a 1.5-hour period.

The airborne observers measured meteor rates and magnitudes and collected spectroscopic data with a wide variety of instruments. They were able

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## Ames 2007 Combined Federal Campaign kicks off Oct. 10

The Combined Federal Campaign (CFC) supports and promotes philanthropy through an employee-focused, cost-efficient and effective program by providing all federal employees the opportunity to improve the quality of life for all of those who, for one reason or another, are disadvantaged. The campaign was established in 1961 by President John F. Kennedy to consolidate numerous charitable campaigns, allowing for a single annual campaign in all federal, postal and military agencies. Donations to the CFC support more than 2,000 local, national and international charities.

The campaign theme this year is '2 Minutes 2 Make a Difference.' Two minutes sounds inconsequential, but two minutes every day is about all it takes to do phenomenal things. We can save lives, feed the hungry, cure diseases, comfort, heal, mentor, encourage, preserve, enlighten, enable and enrich the lives of people here at home and around the world--by giving two minutes a day of your time through payroll deduction or cash donation.

the 2007 campaign will be held Oct. 10 from 10 a.m. to 11:30 a.m., in the Main Auditorium (N-201). During this time, a group of volunteers will distribute the brochures and facilitate your con-

goal by more than \$25,000. We can do even better this year, particularly since even the smallest contributions can make a big difference to the receiving organizations. More details about



NASA photos by Dominic Hart

Ames Center Director S. Pete Worden is seen here (third from right) with the 2007 CFC Ames Team. Left to right: Epifanio Munoz (Code REE), deputy campaign chair; Don Durston (Code AOX), senior CFC advisor; Caroline To (Code SS) financial chair; Tony Gross (Code T) campaign chair; Center Director S. Pete Worden; Femy McGrath (Code DL), special events chair; and Meredith Moore (Code D), CFC program coordinator.

tributions through WebTADS or via a cash donation.

All of the information about the CFC organizations, as well as your pay period contributions, will be on the WebTADS site, making it extremely easy and convenient to click in your contribution. The goals for the 2007 campaign are total contributions of \$245,000 and 100 percent participation by the Ames civil service employees.

Last year, through the participation of less than 37 percent of

how you can help 'Change Tomorrow Today' through the CFC will be announced soon. Ames Center Director S. Pete Worden and all organization directors at Ames enthusiastically support a successful 2007 campaign.

The center has a terrific CFC team this year, including the Ames CFC Deputy Epifanio Munoz (Code REE); Femy McGrath (Code DL), special events chair; Caroline To (Code SS), financial chair; and Yuliana Virchenko (Code A), awards chair. Together the team will provide you with all of the relevant information to facilitate your contributions, keep you informed as to how the center is doing toward meeting our goals and bring in representatives from some of the many CFC organizations to help you see how effective CFC contributions really are. There will be special CFC events during the campaign period.

Note that the Combined Federal Campaign has been designed to allow employees to easily specify the agencies of their choice to donate to,

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Ames CFC Advisor Don Durston (left) received a Superior Achievement Award from Ames Center Director S. Pete Worden for his sustained contributions and outstanding continuous leadership of the Ames campaign since the early 1990s.

The 2007 CFC campaign at NASA Ames will kick off Oct. 10 and wrap up on Nov. 16. The kick-off event for

the federal employees and retirees at Ames contributed more than \$245,368 to CFC, exceeding the Ames campaign

## NASA collaborates with Russia on Foton-M3 mission

NASA collaborated with Russia on a new robotic mission to conduct biological studies. The Russian Foton-M3 mission launched on Sept. 14, 2007, from Kazakhstan, and NASA scientists

Foton-M3 launched aboard a Russian Soyuz-U rocket. It utilized a modified Vostok spacecraft, which contained a service module, solid-fuel retro-rocket unit and batteries. The robotic spacecraft flew in low-Earth orbit for 12 days before releasing its reentry module to land in either northern Kazakhstan or southern Russia on Sept. 26, 2007.

"NASA's long-term goal is to use simple, easily maintained species to determine the biological responses to the rigors of spaceflight, including the virtual absence of gravity," said Kenneth Souza, (Code SC), who serves as the project scientist.

For the Foton-M3 mission experiments, NASA Ames scientists developed eight, one-inch-deep aluminum

boxes called "attics" to house a small, battery-powered video camera for in-flight video recording, a solid-state video recorder, infrared light emitting diodes and a pump to provide water for the newts and geckos. A timer/processor will control the operations of the attic's components during the experiments.

NASA has a long history of cooperative research with the Institute for Biomedical Problems using unpiloted Russian spacecraft starting with the Bion 3 (Cosmos 782) mission in 1975. More recently, NASA participated in the Russian Foton-M2 mission in 2005.

"The Foton-M3 data will help validate the results of NASA's Foton-M2 investigations. Fundamental space biology studies, such as those related to Foton-M2 and Foton-M3, advance human knowledge of the effects gravity has had, and continues to have, on all terrestrial life," Skidmore said.

BY MICHAEL MEWHINNEY



Scientists are seen here preparing biology experiments for the Foton M3 mission in the new microgravity lab at ESTEC, in Noordwijk, The Netherlands. Foton M3 was launched in mid September. The unmanned capsule spent 12 days orbiting the Earth exposing it's payload of experiments to microgravity.

participated in several of the mission's experiments. The launch was on schedule and flawless. The launch took place on schedule at 3 p.m. Moscow time and insertion into orbit occurred 10 minutes after launch.

NASA scientists hope the data obtained from the Foton-M3 mission will improve research techniques. The experiments will increase fundamental knowledge of the effects of space on genetics, cell proliferation and tissue regeneration, as well as the physiological effects of microgravity. Scientists will conduct pre-and-post-flight studies in Russia on bacteria, newts, geckos and snails, which will be flown on Foton-M3. As part of the collaboration, U.S. and Russian scientists will exchange all scientific data obtained from the experiments.

"A team of U.S. scientists has been invited to participate in the experiments, and our role as co-investigators will be to enhance and expand the science conducted during the mission," explained Michael Skidmore of Ames, who serves as the project manager for the Foton-M3 mission. In addition to scientists from Ames, the team also includes scientists from Montana State University, Bozeman, Mont.

## Combined Federal Campaign kicks off Oct. 10

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or you may wish to give to the CFC in general, which then distributes the money in proportion to the monies received by the charities designated by other donors. The CFC brochure lists hundreds of agencies to consider and can be viewed on the Inside-Ames Web site.

Here are just a few of the good reasons to give to the CFC:

- Assist our military who are returning from Iraq and their families;
- Assist the Gulf states hurricane and flood relief effort;
- Help the less fortunate in our community; and
- Benefit from IRS deductions for your charity donation.

Finally, the center pays special tribute to Don Durston this year for his in-

credibly long service to the CFC and to Ames. Since before 1990 until today, he has been the thread of continuity for a succession of chairpersons, keeping detailed notes of how to proceed, developing computer tools to help each year's team keep on track, and most importantly, provide advice and council through the years. Congratulations, Don, for a job very well done.

For further information, or the answers to any questions about the 2007 CFC, contact the author and campaign chairperson, Tony Gross, at ext. 4-2727 or by e-mail at [agross@mail.arc.nasa.gov](mailto:agross@mail.arc.nasa.gov). You can also contact the deputy chairperson Epi Munoz at ext 4-2634 or by e-mail at [emunoz@mail.arc.nasa.gov](mailto:emunoz@mail.arc.nasa.gov).

BY ANTHONY R. GROSS,  
2007 AMES CFC CHAIRMAN

## Teaching Institute brings talented students to Ames

The Ames University of California Santa Cruz, University Affiliated Research Center's (UARC) Systems Teaching Institute (STI) provides student programs in support of task orders assigned by NASA Ames to the UARC. The STI facilitates interaction among university faculty, students and Ames researchers, and develops human resources in areas of importance to the NASA Ames mission. The STI takes a proactive role in mentoring students, a role that compliments the relationship between the student and the research supervisor.

This has been an exciting year for the STI. The Graduate Student Internship Program doubled in size and recruited students nationally. The STI also hosted a new program for 2007: the Small Spacecraft Summer Study Program (S4P).

The UARC solicited proposals from scientists throughout the University of California system to conduct a student-oriented study for a low-cost, scientific mission in collaboration with the NASA Ames Small Spacecraft Center. Funding was awarded to University of California Berkeley Space Sciences Laboratory to carry out a design study for a Lunar Science Orbiter. Six students were selected to



*Systems Teaching Institute interns are seen here outside the Exploratorium in San Francisco during their first summer field trip.*

Ames, they have many opportunities to network with their peers, including field trips, bi-monthly Journal Club barbecues, tours of Ames facilities and small workshops. The S4P students even hosted a wine-and-cheese recep-

tion research, a vibrant community which is the Silicon Valley, convenient living accommodations and many activities sponsored by the various student programs here at Ames. It is a great setting for growth and self-discovery," she said.

The programs closed with the second annual STI end-of-summer symposium held in the conference center ballroom. The symposium gave students the opportunity to showcase their work and they were very motivated to do well. A panel of judges spent the morning evaluating the posters, and awards were given for the best presentations.

"The posters were much better this year, due in large part to the efforts of the STI director and staff, who ensured the students were briefed on presenting their work in a successful manner," says Maylene Duenas, UARC COTR and manager of the UARC's educational tasks. Winners DJ Chapman and Casey Kute will receive full travel support to a national conference of their choice.

Clearly, Ames research benefits greatly from the contributions of all of these talented summer students.

BY AMY GILBERT



*photos by Natalie Batalha*

*The UARC Systems Teaching Institute and the 2007 Small Spacecraft Summer Study Program students hosted a wine-and-cheese reception in the newly refurbished Advanced Studies Lab in Bldg. N-239 for Ames Center Director S. Pete Worden recently. Seen here at the event, from left to right, Max Comess, Tess McEnulty, Cassandra VanOutryve, Kartik Kumar, Greg Delory (SSL project director), Ames Center Director, S. Pete Worden and John Shepard.*

work on various aspects of the study ranging from orbit transfer scenarios to thermal, mechanical and electrical systems.

In addition to the practical experience students gain during their stay at

tion for Ames Center Director S. Pete Worden.

"It was a tight-knit group of students this year," says Natalie Batalha, director of the STI. "We have a great environment here for student life: ex-

## The center holds 2007 Ames Honor Awards Ceremony

The 2007 Ames Honor Award honorees received their awards at a ceremony on Sept. 20, 2007, in the Main Auditorium (N-201) in recognition of their outstanding contributions to NASA. A reception was held immediately afterward.

### 2007 AMES HONOR AWARDEES:

#### Administrative Professional

Rosemarie Christensen  
Lawrence D. Lee  
David R. Morse  
Nguyen (Wing) Trang

#### Community Service/Volunteer

Robert L. Bilikas

#### Contractor Employee

Diane M. Carpenter, Science  
Application International Corp.  
Lena L. Contreras, MEI Technologies  
Edward A. Figueira, Scientific and  
Commercial Systems Corporation  
Nicole A. Rayl,  
Enterprise Advisory Services, Inc.  
Scott D. Thomas, QSS Group, Inc.  
Kathleen P. Starmer, Science  
Application International Corp.

#### EEO

Laura W. Doty

#### Engineer

James H. Bell  
Donald T. Ellerby  
Stefan R. Schuet

#### Group/Team

Altair Unmanned Aerial System  
(UAS) Team  
IVAAAN Simulation Team  
KSC Ground Ops Structures Team  
Lunar Lander Handling Quality  
Simulation Team  
Nano ChemSensor Unit Project Team

#### Mentor

David B. Hash  
Wendy L. Holforty  
Michael J. Ospring

#### NASA Employee

Michael D. Watson,  
Marshall Space Flight Center

#### Project Manager

John R. Allmen  
Robert K. Fong  
Joseph J. Totah

#### Safety and Environment

Peter T. Goldsmith

#### Scientist/Researcher

Kalmanje S. Krishnakumar  
Michael J. Schuh

#### Secretary/Administrative

Assistant Support  
Shirley J. Burg

#### Student

Mary Beth Wilhelm

#### Supervisor/Manager

Dolores M. Morrison  
Diane P. Selby

#### Technical Support

Catherine H. Schulbach

#### Technician

Emmett A. Quigley  
David C. Scimeca

## Aurigid show dazzles airborne observers

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to monitor a large surface area near the horizon, where extinction is low at 47,000 feet. Each observer saw about 120 Aurigids during the outburst in a 40-by-30 degree field of view. Results of our counts were called down and were immediately posted on our mission Web site, to the delight of those clouded out or living in parts of the world where the shower could not be seen.

The shower peaked at 04:15 plus or minus 5 minutes PDT, earlier than our predicted 04:36 PDT plus or minus 20 minutes, reported in the Aug. 7 issue of EOS, Transactions of the AGU. At the peak, meteors were detected at a zenith hourly rate of about 100/hr, better than the August Perseids, and within a factor of two from the anticipated rate. The details of the shower profile and particle size distribution will help improve our prediction model.

Comet Kiess, on account of being in a long-period orbit, has returned from the Oort cloud relatively recently.

Whether or not some of the meteors may have been caused by the remains of a proposed primordial comet awaits a further analysis of the many meteor trajectories and spectra that were recorded by airborne and ground-based observers.

The Aurigid Multi-Instrument Aircraft Campaign (Aurigid MAC) was the first deployment of the two Gulfstream V aircraft in a research mission. We received tremendous support and thank all that made this mission possible. Unfortunately for Blasco's daughter, the Aurigid shower will not return in her lifetime, but there will be other opportunities to study unusual meteor showers. At which time, we all hope to do this again.

The first impressions, images and predictions (and instructions on how to submit your Aurigid images) are posted at <http://aurigid.seti.org>.

BY PETER JENNISKENS, SETI INSTITUTE  
PRINCIPAL INVESTIGATOR AURIGID MULTI-  
INSTRUMENT AIRCRAFT CAMPAIGN

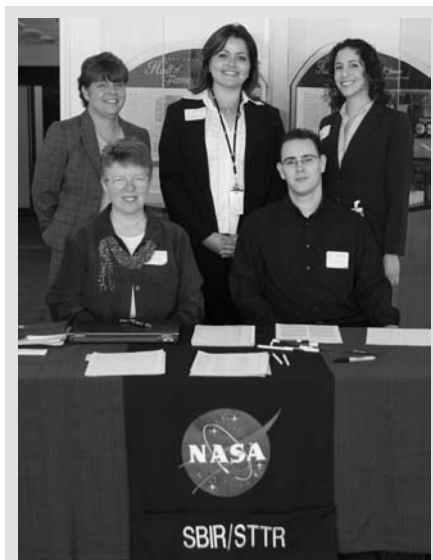
## Small business technology commercialization discussed at workshop

The NASA Ames Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Program hosted a SBIR/STTR Phase I Proposal Preparation workshop held on Aug. 9 and 10 in conjunction with the Small Business Association (SBA) and the Silicon Valley Small Business Development Center (SVSBDC). The Proposal Preparation Workshop was a two-day event, with the first day hosted at NASA Ames.



NASA photos by Dominic Hart

During the SBIR/STTR event, participants were able to ask questions about technology commercialization during a panel moderated by Roger Cohen, standing, far right. Panelists included, from left to right, seated, Carlos Torrez, Dan Kojiro, Chuck Eason and Dhaval Brahmhatt.



Left to right (standing) Paulette Dal Porto, Candice Nance and Sara Villarreal. Seated: Gail Buettgenback and Mike Mooney. The group greeted small business participants for the SBIR/STTR Proposal Preparation Workshop.



Left to right: Mike Mooney, Carlos Torrez, Gary Jahns, Candice Nance and Sara Villarreal. They staffed the SBIR/STTR Proposal Preparation Workshop on Aug. 9, at NASA Ames.

SBIR/STTR Proposal Preparation Workshops, contact the author at Candice.R.Nance@nasa.gov.

BY CANDICE NANCE

Roger Cohen, a consultant of Roger Cohen International, has been in business for over 14 years providing service to clients in government contract consulting and SBIR proposal consulting. Cohen led a series of workshops varying from tips to writing winning proposals to debriefings on proposals that lost and the lessons learned.

The second day of the event was hosted at the SVSBDC's office in downtown San Jose, where pre-evaluated attendees were able to discuss with Cohen and Chuck Eason of the Solano College Small Business Development Center, the feasibility of their tentative proposals.

For questions regarding future



### The 5th Annual Hispanic Heritage Golf Tournament October 12, 2007

at the Moffett Field Golf Course  
Registration at 9:00 am  
Starting time at 10:00am  
Cost is \$75 with Golf Cart  
(Registration pays for a round of golf, golf cart use, tee prizes, BBQ lunch, range balls and more!)

Great Raffle prizes, Raider Tickets, Niner Tickets, Golf Bags, Pictures and More

Everyone is welcome! So come out and have fun!

To Register contact Salena Japlit at (650)604-6811  
Please pay registration fee promptly.

### SCRAMBLE TOURNAMENT



Sponsored by the Ames Hispanic Advisory Committee for Employees (HACE)



The New Agency-wide  
Messaging and Collaboration  
Initiative Has Landed at Ames!

Visit the NOMAD website to view  
the new schedule to see when  
**YOU** will be migrating

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**NASA Operational  
Messaging  
& Directory**

<http://nomad.arc.nasa.gov>

## Prevent pollution: recycle, reduce, reuse and respond

With garbage becoming a major source of environmental pollution, now more than ever, recycling and conserving resources makes good sense. According to the California Integrated Waste Management Board, decomposing garbage in landfills is a primary source of man-made methane, a greenhouse gas 20 times stronger than carbon dioxide in trapping heat in the Earth's atmosphere.

NASA Ames recycles more than 50 different materials ranging from office paper to hazardous waste. In 2006, Ames spent \$336,000 to dispose of garbage at a cost of \$203 per ton--in contrast to the \$8 per ton spent to remove recyclables.

Unlike refuse, recyclables have the potential to return significant savings, if managed correctly. In Phase 1 of the 14-foot wind tunnel demolition project completed in July, Ames recovered virtually all of the demolition debris--over 39 tons of copper, brass and aluminum; 3,000 tons of steel; and 2,500 tons of concrete.

To help increase awareness of wise use and recycling options, the EPA provides an easy-to-download 'Consumer's Guide to Recycling' located on the Internet at: [www.epa.gov/epaoswer/non-hw/reduce/catbook/index.htm](http://www.epa.gov/epaoswer/non-hw/reduce/catbook/index.htm)

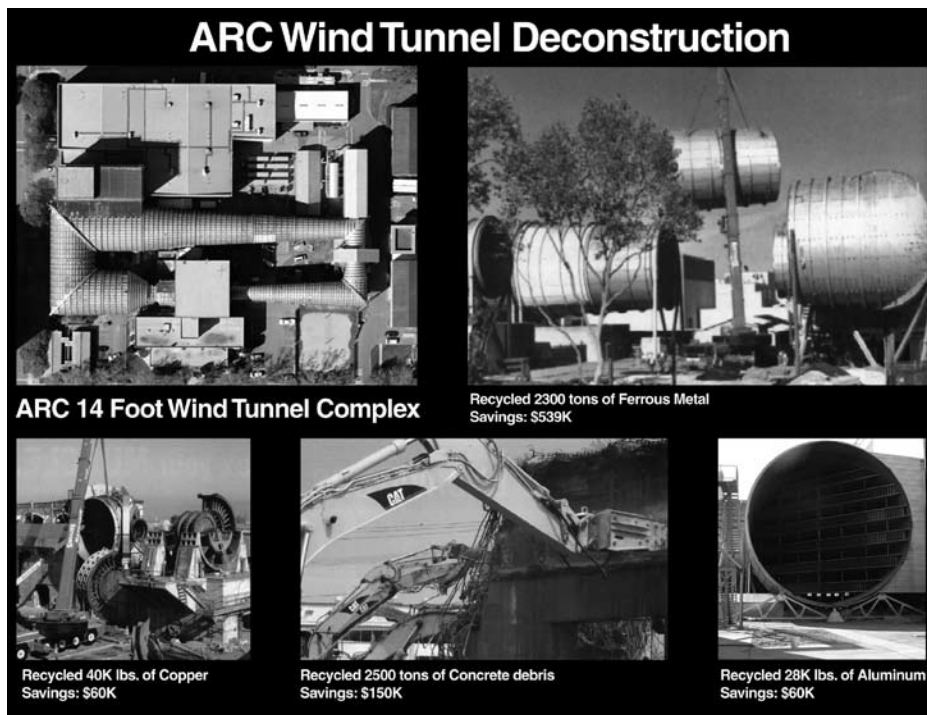
### Sample Tips for Reducing Solid Waste:

#### REDUCE

1. Reduce packaging waste by choosing products with the least unnecessary packaging.
2. Reduce waste toxicity by using non-hazardous alternatives for cleaning and other needs.

#### REUSE

3. Make reusable products a habit; bring your own coffee mug to work and pay only 75 cents for Mega Bites Café coffee.



4. Maintain and repair durable products and take advantage of 'Energy Saver' appliances to reduce your electrical, gas and water bills.

5. Reuse bags, containers and other items at home, at work and when you go to the store.

6. Borrow, rent or share items used infrequently. Before discarding old tools, camera equipment, or other goods, offer them to friends, relatives, neighbors, or community groups.

7. Sell or donate goods instead of throwing them out to organizations who can use them--senior citizen centers, thrift stores and nonprofits.

#### RECYCLE

8. Select products made from recycled materials such as bottles, cans, paper wrapping, bags, cereal boxes, cartons and other items.

9. Support recycling at work and in curbside programs, drop-off collections and community recycling drives.

10. Compost food scraps and yard trimmings. If you have a yard, allow grass clippings to remain on the lawn to decompose and return nutrients back to the soil.

#### RESPOND

11. Help educate and spread the word about the benefits of reduction, recycling and composting with family, friends, neighbors, local businesses and decision-makers.

12. Be creative and try one new way to reduce waste quantity and toxicity every week such as minimizing junk mail by writing the Direct Marketing Association to remove your name/address from subscription lists.

Make a positive impact; download and post the latest NASA recycles flyer: <http://q.arc.nasa.gov/qe/p2/NASAREcycles4copy.pdf>

For information about recycling, contact Mark Lacy at ext. 4-1406.

BY APRIL NEILSON



## TOOWiLD call to Hill helps increase technology awareness

A group of NASA Ames aeronautics researchers were recently invited by the Aeronautics Research Mission Directorate's Airspace Systems Program (ASP) to participate in the Joint Planning and Development Office's (JPDO) Next Generation Air Traffic System 'NEXTGEN Day on Capitol Hill,' on two separate days.

Ames researchers Dr. Everett Palmer, Dr. Walter Johnson and Nancy Smith of the Human Systems Integration Division, along with San Jose State University researchers Dr. Thomas Prevot and Vernol Battiste, were asked to offer demonstrations of their Trajectory Oriented Operations with Limited Delegation (TOOWiLD) concept to members of the House of Representatives and the Senate on Capitol Hill.

The first event, held in the House Science committee room on the third floor of the Rayburn Building, attracted a crowd of Washington's air transportation elite.

Among a long list of speakers were Secretary of Transportation Mary Peters; members of the House of Representatives Hon. Bart Gordon (D-TN), chairman, Committee on Science and Technology; Hon. Mark Udall (D-CO), chairman, Subcommittee on Space and Aeronautics; NASA Administrator Michael Griffin; and FAA Administrator Marion Blakey.

The occasion also provided an opportunity to give hands-on demonstrations of TOOWiLD to Secretary Peters; Administrator Blakey; Vernon Ehlers, Congressman (R-MI), Member of the House Committee on Science and Technology and the Committee on Transportation and Infrastructure; the Hon. James Oberstar (D - MN), Chairman of the House Committee on Transportation and Infrastructure; and Dr. Lisa Porter, NASA associate administrator for Aeronautics.

The JPDO was established to facilitate the process of transforming today's national air transportation system into the system that will be required by the year 2025. Termed NEXTGEN, this concept for the future is envisioned to be more efficient, capable of meeting increased airspace demand, and able to handle a wide



photo by J.D. Harrington

San Jose State employee Dr. Tom Prevot, (right) demonstrates TOOWiLD to the Hon. James Oberstar (D - MN), chairman of the House Committee on Transportation and Infrastructure, (second from right) and Dr. Lisa Porter, NASA associate administrator, Aeronautics Research Mission Directorate (far left) at NEXTGEN day on the Hill. Dr. Jaiwon Shin, deputy associate administrator, NASA Aeronautics Research Mission Directorate, is shown second from left.

range of new aircraft and aviation business models. The ASP and its NGATS Airspace Project are heavily involved in making this vision a reality.

The TOOWiLD concept, developed here at Ames, supports an air/ground integration theme, combining time-based metering, strategic trajectory-based operations and limited delegation clearances.

During the Hill Days, the TOOWiLD concept used the Ames-developed Multi-aircraft Control System (MACS) software and the 4-D Cockpit Situation Display (CSD) software to offer hands-on, interactive, air and ground demonstrations. The set-up used tabletop computers placed on a tabletop as pilot and controller stations, and allowed participants to view the interaction on two 30" monitors mounted on stands against a backdrop. This MACS/CSD configuration offered Capitol Hill dignitaries a comprehensive understanding of the future air and ground elements proposed for NEXTGEN.

At the second event, the group responded to a second call to the Hill. This time the event took place in the

U.S. Senate's Dirksen Building. It was co-hosted by Senators John D. Rockefeller IV, chairman and Trent Lott, ranking member, of the Committee on Commerce, Science and Transportation/Subcommittee on Aviation Operations, Safety and Security. This gathering was attended by many of the same high-ranking government leaders. The original Ames group returned, this time with Nancy Johnson, a San Jose State employee, in place of Nancy Smith.

The team presented TOOWiLD using the MACS/CSD software to offer event attendees an opportunity to try their hand at being pilot or controller in a simulated air traffic environment. The response was overwhelmingly positive from all who visited the booth.

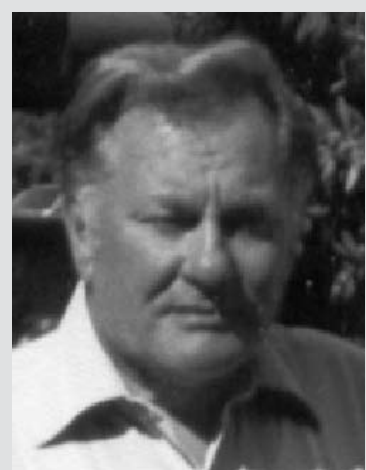
These appearances on Capitol Hill have increased awareness among technology decision-makers in the House and Senate, as well as leaders in industry and government aviation communities of the work being conducted at Ames Research Center.

BY LESLYE MOGFORD AND GAYE GRAVES

## In Memory of . . .

# Robert Reynolds, aeronautical engineer, passes away

Robert 'Bob' Maurice Reynolds, who worked as an aeronautical engineer at NASA Ames from 1945 to 1980, passed away Aug. 4, 2007, from



Robert 'Bob' Reynolds

complications resulting from cancer treatment. He was 85.

After serving as an officer in the U.S. Navy at Moffett Field during World War II, Reynolds worked at NASA Ames as an aeronautical engineer. He received a master's degree from Stanford University in 1957 and worked for NASA until his retirement in 1980.

While at NASA, Reynolds was part of a team of researchers who conducted groundbreaking aeronautical research and development in Ames' 12-foot wind tunnel.

In the book entitled 'Adventures in Research: A History of Ames Research Center 1940 - 1965,' published for NASA in 1970, Reynold's research was noted for its contribution to the study of wing planforms (page 158); the study of advanced propellers designed to withstand much higher speeds (page 208 and ref. B-32); and the development of conical camber, which increased the range and flight endurance of supersonic airplanes, particularly those equipped with delta wings (RM A58L21, cited on page 247).

In addition, Reynolds--along with his colleague Robert E. Berggren -- co-authored the second chapter in the book entitled 'Ballistic-Range Technology,' published in August 1970 for the North Atlantic Treaty Organization

(NATO) Advisory Group for Aerospace Research and Development. This chapter, entitled 'The Light-Gas-Gun Model Launcher,' focused on the light-gas gun's versatility in launching models having complex shape and a wide variety of weights, sizes and materials.

Also, in June 1971, Reynolds was part of a team of NASA researchers who traveled to Wallops Island, Va., to conduct testing on the A4-4210 Scout S-144C rocket. After Reynolds retired from NASA, he went back to school and learned all he could about computer programming and graphic design.

Reynolds believed he was lucky to have lived during one of the most innovative periods in history, and often marveled at the 'mind boggling'

technological advances made in so many fields, especially space exploration and computers.

Reynolds first wife, Joyce, passed away in 1961. He is survived by his second wife of 44 years, Geraldine; daughter Tracie Reynolds of Los Altos; daughter and son-in-law Analee and Steve Wartinger of Santa Clara; son and daughter-in-law Stan and Anita Reynolds of Arcata; stepdaughter Susan Calender of San Francisco; and five grandchildren.

Reynolds was honored in a private memorial at the family's Los Altos home. Contributions in his memory may be sent to: Sempervirens Fund, Drawer BE, Los Altos, CA, 94023 or The National Geographic Society, 1145 17th Street, NW, Washington D.C., 20036.

## NASA Research Park 'ISS Your Lab of Future' scheduled

National Aeronautics and Space Administration

NASA Research Park Exploration Lecture Series

### International Space Station: Your Lab of the Future

- Advancing Education
- Sustaining Life
- Generating Wealth

Tuesday, Oct. 2, 2007 • 7:00 pm  
Arrive early as seating is limited.

NASA Ames Research Center  
At Entrance to Moffett Field (Hwy. 101 & Moffett Blvd.)  
Bldg. 943 • Moffett Field, CA

Free Admission  
Open to the public

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On Tuesday, Oct 2, 2007, from 7 p.m. - 9 p.m., the NASA Research Park Exploration Lecture Series will present a lecture and panel discussion featuring Dr. Baruch S. Blumberg, Nobel Laureate; Thomas B. Pickens III, CEO, SPACEHAB; and Dr. Cheryl Nickerson, associate professor Life Sciences at Arizona State University. This event will take place at NASA Ames Research Center, in Bldg. N-943, in the Eagle Room. For more information, call ext. 4-1731 or visit <http://researchpark.arc.nasa.gov>.

## Clyde Wilson, 95 years young, shares early NACA memories

My name is Clyde F. Wilson, I worked at Ames for 35 years, as a draftsman and later as an aircraft mechanic, and still later as a supervising engineering technician in the hypersonic wind tunnels.

I've been wanting to write to the younger employees at Ames and tell them how it was in 1940, when NACA was just getting started at Moffett Field. Three wind tunnels, two 7-foot-by-10-foot and the 16-foot wind tunnel, were under construction and the "little hangar" was ready for all the office help. About 50 strong.

My family and I arrived at Moffett Field during the first week of June 1940. I had been hired from Los Angeles as a draftsman and was the 29th 'local' civil service employee to be hired at the 'new' NACA aeronautical research center.

I checked in with Ed Schnitker, the branch chief of the drafting section and I asked for the day off to get my family, wife and one child located in a motel for a week or until we could find a rental. The business people of Mountain View welcomed all the new employees with open arms and we rented a house in that city.

The urgency for this letter is, I'm 95 years of age and the pastor of our church asked me "What do you want me to say at your memorial service?" What an assignment! This, and a couple of other letters, I want to complete before I'm not able to do so. My goal now is to reach 100 years of age. My health is good for my age, but who knows? I also want to express my gratitude to NASA for giving me the best 67 years that anyone could ask for, especially when one counts in job security, retirement, health insurance and the prestige of being connected with the space program.

After a few weeks at work at the center, new equipment arrived: a blueprint machine and an automatic photostat machine and my supervisor asked me to run them. One of the jobs was to make copies of all the personnel files of those people who were transferred from Langley Field. The copies were the product of a wet process and the photostat machine turned them out about four per minute. The copies were a negative, white

letters on a black background. I read some bits of information about them and I remember a few figures. The man who was the head engineer in charge of everything earned \$6,500 a year, and the next ranking individual earned \$5,600 a year. I earned \$1,800 a year.

Just a few things that were developed during my 35 years at Ames: ball point pens, hand-held computers, jet engines, automatic transmissions, copy machines, the semi conductor, and television was in it's infancy.

In 1939, my wife and I drove across Los Angeles up the mountain to the Griffith Park Observatory one evening to see a demonstration of a television. For those of you who follow the stock market, the Dow broke 900 in the early forties.

I'm sure the jet engine was in the making before the 1940s, but for most of us, the Lockheed P-80 (Shooting Star) was the first we had seen. It was secret and while it was in the hangar, it had to be in the 'blue room.' One corner was enclosed with large tarps and only those with the proper clearance could go in to install the instrumentation required for the flight tests. On the morning of its departure back to Edwards Air Force Base, the pilot taxied out to the end of the runway, with the fuel truck following so that the fuel tanks could be 'topped off' for

the return flight; the wing tip tanks had been removed.

There were several famous people that visited the center: General Jimmy Doolittle, Charles A. Lindberg, a group of Russian cosmonauts and Vice President L. B. Johnson. An incident occurred during Johnson's visit to the 3.5-foot hypersonic windtunnel. He found out that the overhead lights were left on during the graveyard shift, when no one was in the building. He told us to turn off the lights, and later when we checked with the electrical branch engineers, we discovered that it was more costly to turn the lights on and off every night than to leave them on for the eight hours, when no one was in the building. After that, for several months he was referred to as 'Light Bulb Johnson' (no disrespect intended). Of course, there were other VIPs that visited Ames, but the aforementioned people visited the facility in which I worked at the time.

I just received my Astrogram and was sorry to read that Vic Stevens passed away. I worked on a few of his projects while in the 'new' 40-foot-by-80-foot wind tunnel.

If anyone is interested in some of the old goings on, I can be reach via my son's e-mail address at: [chwilson@hoodriverbnb.com](mailto:chwilson@hoodriverbnb.com)

BY CLYDE F. WILSON

## Come join the Ames Tennis Club

The center is starting an Ames Tennis Club, and you are invited to join. The game of tennis is evolving at Ames. The current state of tennis at Ames can be compared to the state of the tennis courts on base--in need of attention and some tender loving care. The solution: an Ames Exchange-sponsored Ames Tennis Club.

By coming together to form the Ames Tennis Club, a group of tennis players hope to get the ball rolling towards a brighter future for the tennis players and tennis courts at Ames.

In order for the Ames Tennis Club to be successful, we need your help. Join the club and support the game of tennis at Ames. Together, we can help fix and maintain the tennis courts at Ames. Together, we can develop and

share tennis information, equipment and resources and we can do a lot for the game of tennis at Ames. Best of all, we can all expand our network of tennis players and create more opportunities to play. Tennis is a great sport to immerse yourself in, to improve your health, to meet people and to relieve stress. It does not matter what level of tennis player you are. Whether you are a beginner or a professional tennis player, you are wanted and welcome to join the club. A tennis club is a great way to meet people with similar goals, skills, fitness and love of the game.

For more information, contact the author at e-mail: [John.F.Nguyen@nasa.gov](mailto:John.F.Nguyen@nasa.gov) or call ext. 4-2151.

BY JOHN NGUYEN

# Ames Ongoing Monthly Events Calendar

**Ames Amateur Radio Club**, third Thursday of each month, 12 noon, N-T28 (across from N-255). POC: Michael Wright, KG6BFB, at ext. 4-6262.

**Ames Ballroom Dance Club**, Classes on Tuesdays. Beginning classes meet at 5:15 p.m. Higher-level class meets at 5:50 p.m. Held in Bldg. 944, the Rec. Center. POC: Helen Hwang at helen.hwang@nasa.gov, ext. 4-1368.

**Ames Nimble Knitters Club**, every Tuesday at 11:30 a.m., in Bldg. N-241/Rm 237. POC: Rosalyn Jung at knitfan2@yahoo.com or Diane Alexander at ext. 4-3140. Web info at <http://knit.arc.nasa.gov>

**Ames Bicycling Club**, Every 3rd Weds., of the month, in Bldg. N-245 Auditorium, 12 noon - 1 p.m. Contact Julie Nottage at jnottage@mail.arc.nasa.gov, ext. 4-3711.

**Ames Bowling League**, Homestead Lanes on Thursday nights at 6:20 p.m. Seeking substitute bowlers. Questions to sign up: Mike Liu at ext. 4-1132.

**Ames Child Care Center Board of Directors Mtg**, every other Monday in N-262/Rm 180 from 1- 2:30 p.m. POC: Sally Miller, ext. 4-5411.

**Ames Contractor Council Mtg**, first Wednesday each month, 11 a.m., N-200, Committee Room. POC: Chris Johnson, ext. (650) 938-8017.

**Ames Federal Employees Union (AFEU) Mtg**, third Wednesday of ea. month, 12 p.m. to 1 p.m., Bldg. 221, Rm 104. Guests welcome. Info at: <http://www.afeu.org>. POC: Marianne Mosher, ext. 4-4055.

**Ames Mac Support Group Mtg**, third Tuesday of ea. month, 11:30 a.m. to 1 p.m., Bldg. N262, Rm 180. POC: Tony ext. 4-0340.

**Ames Model Aircraft Club**, flying radio-controlled aircraft at the north end of Parsons Ave. on weekend mornings. POC: Mark Sumich, ext. 4-6193.

**Ames Sailing Club Mtg**, second Thursday of ea. month (March through Nov), from 12 p.m. - 1 p.m. in Bldg. N-262, Rm 100. URL: <http://sail.arc.nasa.gov/>. POC: Becky Hooley, ext. 4-2399.

**Environmental Forum**, first Thursday every other month, 9 a.m. to 10 a.m., Bldg. 218/2nd floor training room. URL: <http://q/qe/events/EHSSeries/> POC: Stacy St. Louis at ext. 4-6810.

**The Hispanic Advisory Committee for Excellence (HACE) Mtg**, first Thurs of month in N255 room 101C from 11:45 a.m. to 12:45 p.m. POC: Eric Kristich at ext. 4-5137 and Mark Leon at ext. 4-6498.

**Jetstream Toastmasters**, Mondays, 12 p.m. to 1 p.m., N-269/Rm.179. POC: Miwa Hayashi at ext. 4-1397, mhayashi@mail.arc.nasa.gov, Web: <http://jetstream.freetoasthost.com>

**Native American Advisory Committee Mtg**, fourth Tues each month, 12 noon to 1 p.m., Bldg. 19, Rm 1096. POC: Mike Liu at ext. 4-1132.

## Ames emergency announcements

To hear the centerwide status recording, call (650) 604-9999 for information announcements and emergency instructions for Ames employees. You can also listen to 1700 KHz AM radio for the same information.

## Safety Data

**NASA-Ames Occupational Illness-Injury Data for Calendar Year-to-Date 2007 Jan. 1, 2007 - Aug. 31, 2007**

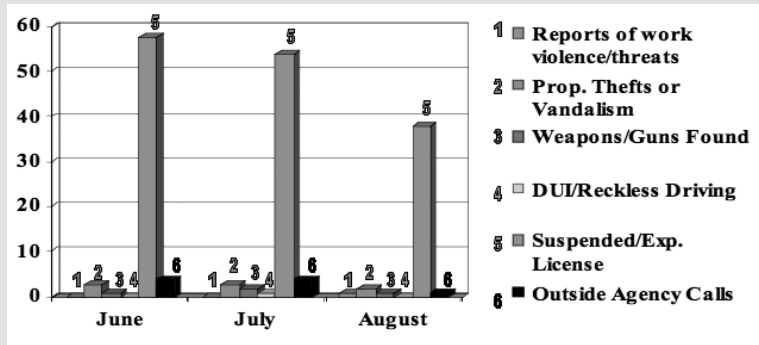
	Civil Servants	Contractors
First aid cases	9	13
Lost Workday cases	0	2
Recordable cases	1	2
Restricted duty days	0	0

Above data are as of Aug. 31, 2007. May be subject to slight adjustment in the event of a new case or new information regarding an existing case.

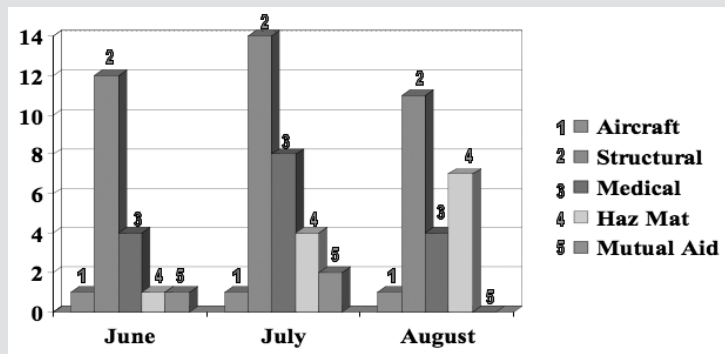
## Protective Services monthly activity

A statistical summary of activities of the Protective Services Division's Security/Law Enforcement and Fire Protection Services units for the month of August 2007 is shown below.

Security/Law Enforcement Activity



Fire Protection Activity



## Ames Classifieds

Ads for the next issue should be sent to [astrogram@mail.arc.nasa.gov](mailto:astrogram@mail.arc.nasa.gov) and must be resubmitted for each issue. Ads must involve personal needs or items; (no commercial/third-party ads) and will run on a 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. Caveat emptor!

### Housing

Modern townhouse in downtown Menlo Park available for short term rental. 3 spacious bedrooms, 2.5 bath, fireplace, fantastic private gated yard. Will be available in December. Perfect for a family doing a remodel, visiting researcher, etc. \$3,500/month. Call (650) 473-1447.

House for sale by owner. Charming starter home in the most desirable section of San Leandro. 3bd/1 ba, one-car garage. Move-in condition: hardwood floors, seismically reinforced foundation, fireplace, termite-free. Fruit trees, deck and open view in backyard. Family neighborhood. Asking \$530K. Call (510) 471-9384.

### Transportation

'95 Jeep Cherokee, green, only 41,000 miles. Automatic transmission, 2 or 4-wheel drive. Driver's side air bag, power seats, windows, locks and steering. \$3500. Call (650) 473-1447.

### Miscellaneous

The Ames Cat Network needs help finding homes for cats trapped at Moffett. They range from feral to abandoned/lost pets. Tested, altered and inoculated. Call Iris at ext. 4-5824 if you or someone you know are interested in fostering or adopting a cat.

Collection of high-quality bronze whale sculptures by Randy Puckett. Approx. 15 pieces available. E-mail [acsullivan@comcast.net](mailto:acsullivan@comcast.net) for items, photos and prices.

Solid copper hanging pot rack with 12+ copper hooks. Oval shape and approximately 38" in length and 18" in width. In excellent shape. \$250 (orig. \$400). M. Moore (408) 887-1848.

Five Star vacation condo. You pick location (worldwide) and date (but before Dec. 10). I have week deposited in Interval International that I will not be able to use. Check out <http://www.intervalworld.com/web/cs?a=1500> for resort locations and descriptions. Use my week for \$399. Nans (510) 790-3506.

**The NASA Lodge**  
Rooms starting at \$45 a night.



<http://nacenter.arc.nasa.gov/lodging.html>

Having a B-I-G family reunion and just run out of bedrooms and inflatable beds? Reserve rooms at the NASA Lodge

Ames employees and contractors can "host" their friends or relatives at the Lodge, and it doesn't have to be government or NASA related.

Let Us Welcome You!

Call (650) 603-7101



## Exchange Information

Information about products, services and opportunities provided to the employee and contractor community by the Ames Exchange Council. Visit the web site at: <http://exchange.arc.nasa.gov>

**Beyond Galileo Gift Shop** N-235 in the cafeteria, 8 a.m. to 2 p.m., ext. 4-6873

Don't forget to purchase your baby shower, birthday, holiday gifts at Ames' two gift shops!

**Visitor Center Gift Shop** N-943 M-F, 10 a.m. to 4 p.m., ext. 4-5412

NASA logo merchandise, souvenirs, toys, gifts and educational items.

**Tickets, etc...** N-943 outside the main gate, 10 a.m. to 3:30 p.m., ext. 4-5412 and Beyond Galileo, 8 a.m. to 1:30 p.m. ext. 4-6873

**Mega Bites Cafeteria** N-235, 6 a.m. to 2 p.m., ext. 4-5969/Catering ext. 4-2161

See daily menu at: <http://exchange.arc.nasa.gov>

**Moffett Field Golf Club** with 'Tee minus 1' Grill and Sports Bar. Call (650) 603-8026.

**RV Lots Available** Call to reserve a space at (650) 603-7100/01.

Civilian/Contractors, \$50/mo; military \$25/mo

**NASA Lodge (N-19)** 603-7100

Where to stay when you're too tired to drive home? What about the lodge?! Two types of rooms: Bldg. 19 (43 rooms), rate: \$55/night (\$5 ea add'l adult); Bldg. 583 (150 rooms), rate: \$45/night (\$5 ea. add'l adult)

**Ames Swim Center (N-109)** 603-8025

The pool is heated year round! The pool is currently available for lap swim, pool parties and special events. POC -Chana Langley, Pool Manager (650) 603-8025. Memberships: single memberships: \$40/yr. Family memberships: \$60/yr. After purchasing a membership, there is an entrance fee: daily entrance fee - \$3/day or lap pass fee - \$40 for 20 uses. Platinum membership - \$360/yr. (no daily fee). Special events: include military training, swim team events, kayak role practice, etc. The cost for special events is \$50/hr.

### Ongoing Vacation Opportunities

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

Bass Lake vacation rental, 4 mls south of Yosemite. 3bd/1.5 ba, TV, VCR, MW, frplc, BBQ, priv. boat dock. Sleeps 8. \$1,050/wk. Call (559) 642-3600 or (650) 390-9668.

Big Sur vacation rental, secluded 4bd/2ba house in canyon setting. Fully eqpd kitchen. Access to priv. beach. Tub in patio gdn. Halfway between Carmel and Big Sur. \$175/night for 2; \$225 for 4 and \$250 for more, plus \$150 cleaning dep. Call (650) 328-4427.

Pine Mountain Lake vacation home. Access to golf, tennis, lake, swimming, horseback riding, walk to beach. Three bedrooms/sleeps 10. \$100/night. Call (408) 799-4052 or (831) 623-4054.

Incline Village, Forest Pines, Lake Tahoe condo, 3 bdrms/2 ba, sleeps 8, fireplace, TVs/VCR/DVD, stereo w/CD player, microwv, W/D, jacuzzi, sauna, outdoor pool. Walk to lake. Close to ski areas. Visit web site for pictures: <http://www.ACruiseStore.com> \$135/night spring and fall, \$173/night summer and winter (holidays higher) plus \$125 cleaning fee and 12 percent Nevada room tax. Charlie (650) 743-8990.

New York, 5th Ave. One fully furnished bedroom in 24 hour security bldg, overlooking Washington Square Park, \$2,000/wk or \$3,000/mo. negotiable. Call (650) 349-0238.

Paris/France: Fully furnished studio, 5th Arr, Latin Quarter, Notre Dame and Lie-St. Louis, \$1,400/wk. negotiable. Call (650) 349-0238.

Santa Cruz townhouse, 2 bedrooms plus study, 2 baths, decks, totally furnished, 3 blocks from beach, available July, August, September; \$1,600 per month. Call (831) 423-5777 (H) or (831) 277-8476 (C).

Lake Tahoe cabin rental in Agate Bay, North Shore. 4bd/3ba tri-level, AEK, cable TVs, fireplace, BBQ, deck, sleeps 10. Closest skiing is Northstar, Alpine and Squaw. Rates are \$375 a weekend, \$1,000 a week. Call (408) 867-4656.

Florida west coast vacation in St. Petersburg, beautiful 2bd/2ba condo, fully equipped kitchen and furnished, sunset views, 1/4 mile from St. Pete Beach, monthly or 2 week minimum rentals only. Call (703) 299-8889 or e-mail: [jdgoehler@aol.com](mailto:jdgoehler@aol.com)

Monterey Bay vacation rental at Pajaro Dunes, 20 miles south of Santa Cruz, 3bd/2ba beach house with distinctive architecture. Beautiful ocean and valley views, only 150 ft from the beach, first-class tennis courts. \$700/wkend, \$2,100/wk including cleaning by the maid service when you depart. Call (408) 252-7260.

South Lake Tahoe large cabin surrounded by protected forest, 8 miles from Stateline Sleeps 12 comfortably, 4 bd/3ba. Hot tub/pool table/65" TV Matt (408) 482-5286

South Lake Tahoe cozy home backs up to large open meadow, 1 mile from Heavenly Valley. Sleeps 11, 3 bd/2.5 ba. Large deck with hot tub. Matt (408) 482-5286.

## Astrogram deadlines

Please submit articles, calendar and classified advertisements to [astrogram@mail.arc.nasa.gov](mailto:astrogram@mail.arc.nasa.gov) no later than the 10th of each month. If this falls on a weekend or holiday, then the following business day becomes the deadline. For Astrogram questions, contact Astrid Olson at the aforementioned e-mail address or ext. 4-3347.

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## Native plant garden thrives at Ames and helps conserve water

The Ames Plant Engineering Branch and Environmental Services Division have jointly converted a turf-grass area at the Ames Mega Bites Cafeteria, Bldg. N-235, into a California native plant garden.



Native plants bloom outside the Ames Cafeteria.

According to Steve Frankel, chief of the Plant Engineering Branch, "Our organization has long been working to reduce water usage and its associated high cost through various means, such as the introduction of efficient, low-flow irrigation heads, installation of automated controller systems, using mulch to retain moisture (and reduce weeds), introduction of drought-tolerant plants and the implementation of wetting cycles to improve water absorption."

Plant Engineering and Environmental Services analyzed the high water requirements for lawns, and became interested in converting areas of the Ames landscape to drought-tolerant, California native plants.

"We worked together to find a suitable location for a conversion, a spot that received adequate sun and limited wind," said Frankel. A decision was made to convert a problem turf area at Bldg. N-235 to an attractive, native pollinator garden.

"We also wanted to fulfill a center commitment as part of the U.S. Environmental Protection Agency Performance Track," says Kran Kilpatrick of the Environmental Services Division. Under the program, Ames had

set a goal to "design and install a demonstration garden project for native plant species including walkways and benches constructed from post-consumer, recycled materials. Native plants reduce on-site use of pesticide and herbicide and promote ecosystem health," he said.

The walking path borders were made from recycled materials. After an initial establishment period, all of the plants at this location will survive on little or no supplemental

water. The water savings at this site alone, are estimated at more than 6,000 gallons per week. Not only are the savings impressive, the garden also is very attractive.



Steve Frankel (left) and Al Lyon of the Plant Engineering Branch install a sign at the native plant garden near the Ames cafeteria.

If you haven't seen it yet, visit the north side of the cafeteria. Signs have been installed near the plants, so that people can identify them and maybe consider planting them in their gardens. "The plants and flowers are beautiful and fragrant; the hummingbirds, bees and butterflies are abundant, and best of all, everything you see is native," said Al Lyon of the Plant Engineering Branch.

BY STEVE FRANKEL AND AL LYON



National Aeronautics and Space Administration

Ames Research Center  
Moffett Field, CA 94035-1000



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