

# The Ames Astrogram

Communication for the Information Technology Age

March 11, 2002

## Early NASA 'pioneer' still on the job in deep space

It took a little extra effort, but NASA, on Mar. 2, bridged a nearly seven-and-a-half billion mile span to make contact with Pioneer 10, a plucky space probe that first left Earth's gravitational pull more than 30 years ago.

On Mar. 1, scientists at the NASA Jet Propulsion Laboratory's (JPL) Deep Space Network in Goldstone, Calif., sent a signal to the spacecraft, which is still hurtling toward the fringes of the solar system. Twenty-two hours later, at 1:47 p.m. PST, researchers at the network's facility in Madrid, Spain, carefully monitoring a 70-meter dish antenna, heard Pioneer's response.

"We are overjoyed that we still have the spacecraft," said Robert Hogan, chief of NASA Ames' Space Projects Division, where the Pioneer project is managed.

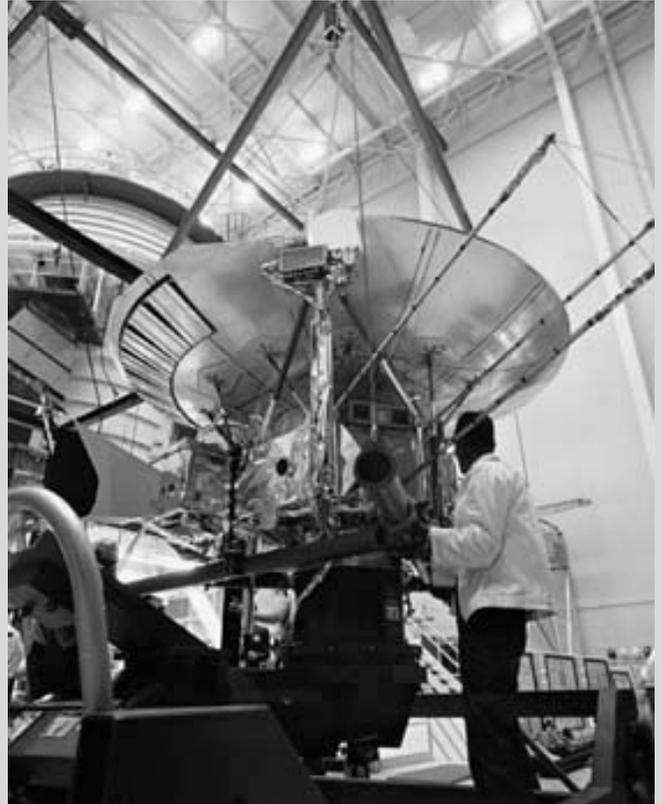
"As an eternal optimist, I was confident it would succeed. Pioneer 10 has been discounted in the past, but somehow it always manages to land on its feet," recalled Ames' Pioneer 10 Project Manager Dr. Larry Lasher. "This success is a testament to good solid design."

"From Ames Research Center and the Pioneer project, we send our thanks to the many people at the Deep Space Network and JPL who made it possible to hear the

spacecraft signal again," said Pioneer 10 Flight Director David Lozier.

NASA previously lost contact with Pioneer 10 in August 2000, but made contact again in April of last year by switching the spacecraft to a different communications mode. NASA most recently made contact with the spacecraft on July 9, 2001.

Launched on March 2, 1972, Pioneer 10, built by TRW Inc., Redondo Beach, Calif., is now 7.4 billion miles from Earth. Pioneer 10 was the first spacecraft to pass through the asteroid belt and the first to make direct observations and obtain close-up



The Pioneer 10 spacecraft at Kennedy Space Center, Florida, being prepared for launch in March 1972.

## British royalty visits Ames



photo by Dominic Hart

On Feb. 27, Prince Andrew, Duke of York, visited NASA Ames Research Center. He is seen here in the Vertical Motion Simulator in N243 flying a tilt-wing simulation.

images of Jupiter. During its tour of the jovian system, Pioneer 10 also charted Jupiter's intense radiation belts, located the planet's magnetic field, and established that Jupiter is predominantly a liquid planet.

In 1983, it became the first man-made object to leave the solar system when it passed the orbit of Pluto, the most distant planet from the sun.

The spacecraft continued to make valuable scientific investigations in the outer regions of the solar system until its science mission ended on March 31, 1997. Pioneer 10's weak signal continues to be tracked by the Deep Space Network as part of an advanced concept study of communications technology. The probe was also used to help train flight controllers how to acquire radio signals from space.

Pioneer 10 is headed toward the constellation Taurus, where it will pass the nearest star in the constellation in about two million years.

"Pioneer 10 has performed much better than expected," added Hogan, who also is a member of the original launch team for the spacecraft. "It's amazing that it's lasted this long."

Scientific data received from Pioneer 10's

*continued on page 5*

## New 'smash proof' plastic is great for aircraft windshields

A new, essentially 'smash-proof,' plastic may someday be the material of choice for safer aircraft windshields and other uses for which strength is important.

The novel, clear plastic is scratch- and solvent-resistant. It also sheds water and ice more easily than current windscreen plastics, enabling pilots to see better, according to its inventor, a retired Ames aerospace researcher. Further, it resists impacts better than today's plastics, he said.

"The raw material in the new plastic costs one-fifth of that used in current plastics, and the novel plastic is lighter in weight than similar synthetic materials, making it ideal for use on spacecraft," said Dr. Len Haslim, retired from Ames. He now is an Ames associate, still performing scientific research.

The patent-pending plastic system is composed of three primary components. Varying how much of each is put into a given plastic batch will result in plastics with varying properties, according to Haslim. "Engineers can tailor the plastic for each kind of use," he said.

Because it is optically clear and can be shaped easily, the new plastic is particularly suitable for aeronautical uses, especially for aircraft canopies. If a bird hits an airplane windshield, the impact may do serious damage, endangering the people onboard. The hard plastic resists such hits and strikes from pebbles and hail better than comparable plastics, said Haslim, who also is a retired Navy fighter jet pilot.

"As a pilot who has experienced two fractured windshields in his flying career, any improvement in the current materials for aircraft windshields would be greatly appreciated," said Warren Hall, research pilot and assistant director for aviation at Ames.

In addition, when rain and sleet hit the windshield of a light aircraft, visibility can degrade substantially. Haslim's plastic sheds water and ice very quickly because its surface is so 'hydrophobic,' he said. Furthermore, the new material would be a good candidate for aircraft surfaces because it could provide in-flight deicing, he added.

Because it does not soften or melt when heated, the new engineering material is called a 'thermoset' plastic. When reinforced with fiberglass or carbon fabric, the plastic also is excellent for other aeronautical and automotive uses, including computer boards. Independent testing verified that electrical circuit boards fabricated from the new plastic compound are equivalent, or superior to, the best commercial standards, Haslim said.

It resists high temperatures better, and has superior electrical and mechanical properties, Haslim explained. Generally, engineers could use the reinforced, high-strength composite material when their designs require high strength-to-weight ratios, such as for vehicles and structures.

Haslim also has developed a scratch-resistant, durable paint version of the plastic.

"This paint adheres to aluminum, stainless steel and rusty iron with no need for priming," he said. "The paint not only protects the metal below from corrosion, but repels water and ice so well that it also can be called 'hydrophobic.' This paint could be used on airplane surfaces to reduce icing, and the paint could be used on ships to reduce 'drag' in the water, increasing fuel efficiency," he explained.

"This new plastic is made of nothing more than a hydrocarbon resin, and it is very non-reactive. Because the hydrocarbon molecules are connected in chains, the material is extremely hard and smooth," Haslim said.

Like the lines that make up fishnets, the very long hydrocarbon molecular chains in the new plastic form nets because the chains are tied to each other by cross-linking. In addition, these hydrocarbon nets are tied to similar nets above and below them, creating an extremely strong, non-melting material. In contrast, non-cross-linked plastics have

strands of molecules that can easily slide apart when heated, and will melt.

"The new material is so smooth, impact resistant and non-reactive, a manufacturer of artificial heart valves intends to investigate whether or not it would be a better material for fabrication of heart valves, and if it would minimize clotting and destruction of blood cells," Haslim said.

In addition, the tough, clear plastic is advantageous if used as a window glass substitute, especially for schools. School districts could find that the new material might reduce maintenance costs because it is break-resistant. Also, clean-up crews can use solvents to easily remove graffiti without clouding or damaging the plastic's surface.

The novel plastic some day may help NASA meet its goals of greatly improving aircraft safety and easing aircraft maintenance. The patent-pending material is available for use by U.S. industry.

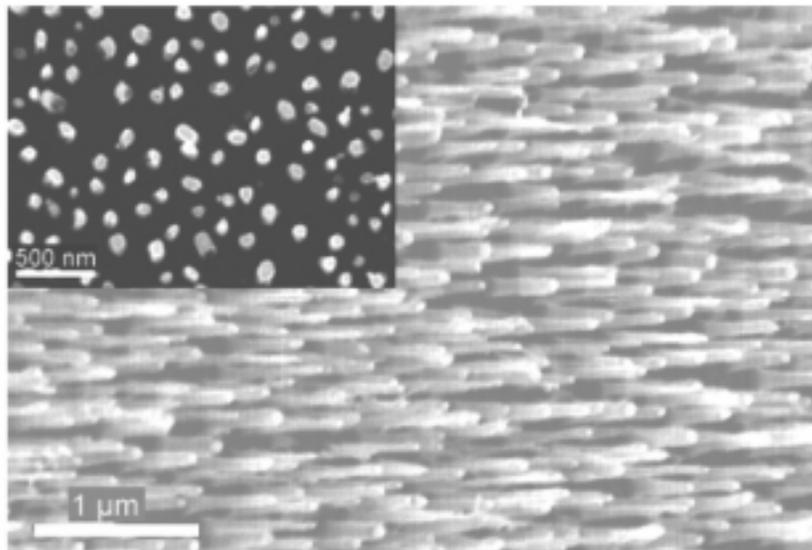
BY JOHN BLUCK ▲

## Micrographs combine to make miniature U.S. flag

Lance Delzeit of Code SSX, with the help of Kris Matthews of San Mateo High School, recently created an image of a U.S. flag by combining two electron microscope pictures of carbon nanotubes.

The photo of the flag below shows 'flag stripes' that are really one-micron or longer, well-aligned carbon nanotubes on their sides.

vapor deposition," said Meyya Meyyappan who leads the nanotechnology effort at Ames. Scientists at Ames have used the method to grow carbon nanotubes on a microscopic-size cantilever, a beam that is fastened only on one end. Researchers have used the tiny tip of the cantilever to focus on simulated Mars dust and for nano-scale lithography.



These are molecular-sized pipes, a few nanometers in diameter and are made of carbon atoms. A nanometer is one-billionth of a meter. The second photo is an inset of an array of 'stars' that is actually a view looking down at nanotube tips.

"Carbon nanotubes are grown by a method called plasma enhanced chemical

"Another of our goals is to use an array of nanotubes as tiny electrodes in developing biosensors and other sensors," Meyyappan said.

More technical information about nanotechnology can be found on the nanotechnology web site at: <http://www.ipt.arc.nasa.gov/>

## Confined space, what's that?

NASA Ames is committed to providing each of its employees a safe and healthy work environment. Entry into a confined space, here at the center, occurs on a daily basis and can expose you to life-threatening risks. A confined space is a space that:

- is large enough that an employee can, and needs to, enter to perform assigned work; and
- has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, trenches and pits are spaces that may have limited means of entry); and
- is not designed for continuous human occupancy.

Anyone involved in confined space operations may face a number of special dangers: oxygen deficiency; toxic atmosphere; flammable/explosive atmosphere; physical, chemical or mechanical hazards; or a dangerous combination of these.

Confined space accidents do not happen often but when they do, they are usually fatal. At work, 200 people die every year from inhalation of lethal vapors or oxygen deficiency. Confined spaces are involved in many of these deaths. The number for deaths at home is much worse at 1,000 every year.

Recognition is the first step in controlling any hazard. While confined spaces come in many different forms, they typically have limited routes of entry and exit and lack natural ventilation. Therefore, any change in the quality of the air occurs rapidly. These are dangerous conditions for anyone who must work inside the space.

The confined space entry program at Ames is meant to minimize these through

classification of confined spaces, an entry-permit-required system, procedures that are permitted including alternate procedures and training.

The procedures found in Chapter 26 of the Ames Health and Safety Manual enable Ames managers, employees and contractors to effectively meet federal OSHA requirements designated in 29 CFR 1910.146, permit-required confined spaces. This chapter is applicable to all Ames employees, civil servants and contractors alike, and to all equipment and property managed by Ames. For Ames contractors, it is applicable through the contract clauses in conformance with NASA procurement regulation (part 1, subpart 52 and part 14, subpart 6).

Area supervisors and managers are responsible for ensuring that risk assessments of potential confined spaces within their area(s) of responsibility are made and, when any confined spaces exist in their area, they must ensure that entry into these spaces is controlled in accordance with this chapter and any supporting documents. Also, supervisors should ensure that when the permit is terminated, it and the associated monitoring forms are returned to the confined space program representative at mail stop 218-1 at completion of entry.

Through greater awareness and through employee participation in the confined space program here at Ames, it is hoped that the confined space program will keep all Ames employees safe.

If you have any questions or concerns about this program, contact Lynne Keswani, PAI industrial hygienist, for further information at ext. 4-3680.

### VPP STAR Tip:

*If you have top managers making inspections of the areas for which they have responsibilities, an audit approach would be to check if the inspections were being made and if they followed the procedures set for them. In your evaluation, however, while you may check these audit types of results, you will also be looking to see how well these inspections accomplished their purpose or purposes.*

*....Margaret Richardson, in Preparing for the Voluntary Protection Programs, Copyright @ 1999 by John Wiley &*

## Errata

Leslie (Les) Videll was incorrectly identified in a photo on page 2 of the Jan. 22, 2002 edition of the Astrogram. Videll is actually the second man from the left, wearing glasses in the second row from the front and not the third man from the left, as previously identified. We regret any confusion or concerns this may have raised.

## Ames public affairs Spanish-language web site is big hit!

A new Ames web site written in the Spanish language has garnered high audience numbers in its first weeks of operation, according to a recent web report. The Spanish-language web page is currently the third-most-visited area of the very popular Public Affairs Office 'Amesnews' web site.

Called 'AmesNews en español,' the web site is a shorter version of the Amesnews site, translated into Spanish. The site can be accessed at: [http://amesnews.arc.nasa.gov/index\\_span.html](http://amesnews.arc.nasa.gov/index_span.html)

"We are delighted to see that the new site is being so well received, especially for a recent launch that is still in its infancy," said David Morse, director of public affairs at Ames. "We expect the number of visitors and page 'hits' to increase dramatically as content expands and more people become aware of this exciting resource," he stated.

Elena Kozak, who designed and prepares most of the materials for the web site, has made a concerted effort to include links

to other Spanish-language web sites across all of NASA. Kozak, born in Cuba and a former resident of Mexico as well as other Latin American countries, also does most of the translations of NASA news releases and other materials into Spanish for the web site.

"I have been in the United States for 30 years, and I have received nearly all of my higher education here in the US," said Kozak. "So I felt comfortable in translating between the two languages." Kozak also has a Ph.D. in biochemistry from Cornell University.

"I have been on the sidelines admiring your efforts in reaching these new audiences," said Carolina Martinez of JPL's media relations group. "Being a native Spanish speaker myself, I know that translations don't come easily. Considering that there are a limited number of Spanish web sites, I think bringing them together in one site to provide a bigger picture is a good idea.

Thanks for including the (JPL) 'Space Place' and 'SIRTF' web sites. Saludos."

A recent web report detailing 28 days of activity on the site from Jan. 27 until Feb. 25 shows that 978 parties viewed the page during the month (about 1.23 percent of all visitors to the Amesnews web site). Further, 760 visitors also accessed one or more of the available links. The average visitor spent 2:25 minutes viewing the Spanish-language web page.

Amesnews web site curator Anil Jindia, in cooperation with J.J. Toothman and the Ames web services and monitoring people, provide the web statistics usage data.

"I am pleased and very supportive of this whole new area on our public affairs web site," Jindia said. He also maintains much of the English-language portion of the Amesnews web site.

BY JOHN BLUCK 

## NASA partnership to benefit women scientists

Striving to increase the participation of women in science and technology, NASA officials recently announced the formation of a new partnership with the National Center for Women in Science, Technology, Engineering and Mathematics (STEM).

Ames Center Director Dr. Henry McDonald and Lisa Duncan, president of the board of directors of the National Center for Women in STEM, signed a memorandum of understanding to establish the partnership. Under the terms of the two-year agreement, the two organizations will work together to provide resources and programs to expand the engagement of women in STEM education, research and development.

"This is a wonderful example of a strategic partnership that fits our goal of creating the NASA Research Park, a world-class, shared-use R&D campus bringing industry, academia and nonprofits together for the benefit of NASA and the community," McDonald said.

"I am delighted to form this partnership with the National Center for Women in Science, Technology, Engineering and Mathematics, and look forward to the enhanced opportunities this will create for women in the workplace," he added.

"Our relationship with NASA Ames is an important strategic alliance and an exciting step toward achieving our goals for women in STEM," Duncan said. "NASA exemplifies the excitement and challenge that careers in science, technology, engineering and mathematics can provide. And the opportunity to be located in the proposed NASA Research Park is an exceptional benefit that will enable us to actively participate in stimulating collaborations with NASA and its other partners."

The signing of the agreement with the National Center for Women in STEM comes during the month of March, which as National Women's History Month, has been traditionally designated to highlight some of the extraordinary and courageous achievements by women of all races, religions, social and economic standing. Women have made significant contributions to ensure that NASA accomplishes its missions in the fields of science and engineering.

A non-profit organization, the National Center for Women in STEM was established in 2001 to provide opportunities for synergy and collaboration in order to increase the impact of organizations and individuals working to advance women and girls in science, technology, engineering and mathematics. Leaders of six national women's organizations who share a common vision are guiding the National Center.

In addition to establishing a national resource center at the new NASA Research Park, the agreement also calls for the creation of collaborative programs to expand the technical and scientific workforce by further developing women's scientific and technical talents.

"We have not yet tapped the full potential of women in these fields," said Duncan. "Women and girls have unique perspectives and skills that influence our interpretation of science and technology. By increasing their participation and advancement in STEM, we will maximize the benefits of science and technology in our society."

Working with NASA scientists and engineers, the organization plans to create new educational programs, focusing on curriculum enhancement, faculty/teacher development, and continuing and higher education opportunities for women and girls.

The agreement also calls for providing increased opportunities and resources for research in information science and technology, and product and technology development. The organization hopes to provide assistance with technology transfer, including technical support for the commercialization of NASA-developed technologies and products.

"This collaboration will provide a unique opportunity for women and girls to become involved in the exciting work that NASA does, particularly the work we do here at Ames," said Nancy Bingham, associate director for systems management and planning at Ames.

NASA's goal is to develop portions of Moffett Field into the NASA Research Park (NRP), in association with academia, industry and non profit organizations. The NRP is currently being developed under the NASA Ames Development Plan.

As part of the development process, NASA has established several R&D and education partnerships that provide for research laboratories, office space, classrooms, exhibit halls and other public facilities, such as museums. Academic partners include the University of California at Santa Cruz, San José State University, Carnegie Mellon University, and the Foothill-DeAnza Community College District. Students attending NRP university academic programs will increase Silicon Valley's high-tech workforce of the future.

Information about the National Center for Women in STEM is available on the web at: <http://www.ncwstem.org>

Information about the NASA Research Park can be found on the web at: <http://researchpark.arc.nasa.gov>

Information about women's contributions to the NASA legacy is available on the web at: <http://www.nasa.gov/women/milestones.html>

BY MICHAEL MEWHINNEY ▲

## Employees help out colleagues

Some 305 Ames employees gave about four years of their leave to 32 fellow employees who faced medical and other hardship situations during the last fiscal year.

Donations came from about a fifth of the Ames staff. Staff members donated from two to 240 hours, giving an average of 34 hours each to people in need. The average recipient received almost 250 leave hours.

"Ames people are not only outstanding scientists, engineers and world-class support professionals, they have great compassion for their peers who need help," said Ames Center Director Henry McDonald. "Their overwhelming generosity to their fellow human beings is just one more reason why I am proud to be associated with the people of Ames."

"During the past year, Ames employees donated a total of almost four years of their own vacation time to other employees at the center who had medical or other hardships," said the chief of the Human Resources Division, Dennis Cunningham. "In the past, we have not systematically tried to compile this data, but this seems to represent an increased level of activity and selflessness on the part of the Ames community."

"The reason for the increase is probably a result of employees making an effort to share information about employees with needs," he said.

Those in need received from eight to 1,263 leave hours. Twenty employees received 100 hours or more. Ames employees can select individual fellow employees with medical hardships and then donate leave to them.

For more information about the employee leave donation program, contact Karen Tanner at ext. 4-6987.

# SAFETY SNAPSHOTS



*This feature is one in a series intended to inform the Ames community about facets of Ames' safety and environmental programs.*

## Controlling mold

### PROFILE

Indoor mold has been in the news lately. Exposure to mold can cause a variety of health effects and symptoms. One of the most common is allergic reactions. Molds can be found almost anywhere. It grows on virtually any surface as long as moisture and oxygen are present. There are molds that grow on wood, paper, carpet, foods and insulation. Areas with hot, humid climates, such as the southeast part of the U.S. have more problems than cool, arid locations. It is impossible to eliminate all mold spores in the indoor environment, but mold can be controlled by regulating moisture indoors.

### CLOSEUP

Mold spores are too tiny to be seen with the naked eye. The spores drift through air continually, both indoors and outside. When a mold spore lands on a damp spot it can begin to reproduce and grow. As they grow, the spores gradually digest their host surface. Molds can also produce allergens that may trigger allergic reactions, illness or even asthma attacks.

Since mold requires water to grow, controlling moisture is the key to preventing mold problems. Indoor humidity should be kept between 30 percent and 50 percent. Moisture problems can have many causes such as high humidity, roof leaks or dripping pipes. To prevent mold from becoming a problem in your building or office, contact the JFP trouble desk when you see leaky plumbing, condensation or wet spots. Keep your area clean and when damp or wet conditions develop, fix the problem and dry the area. You can help protect your health with a little careful housekeeping.

Additional information can be found on the internet at: <http://www.epa.gov/iaq>.

## Permit closures

Permit closure requirements are applicable to all civil servants, contractor employees, resident agency personnel, NASA Research Park partners and Crows Landing who operate storage areas permitted under Santa Clara County or other hazardous waste treatment units permitted by California tiered permitting regulations.

There are minimum requirements for all Ames hazardous materials storage and hazardous waste accumulation areas that are regulated by Santa Clara County. The purpose is to protect human health and the environment, and comply with applicable federal, state and local regulations.

Things to remember are:

- The permittee/user responsibility is to inform the Environmental Services Office, Code QE (web site: <http://q.arc.nasa.gov/qe/>) at least 120 days prior to closure. A one-year notice is preferred.

- All actions described in the closure plan must be conducted in a manner that minimizes the need for further maintenance, and controls, minimizes or eliminates threats to human health and the environment from residual hazardous materials in the handling and storage areas. Actions must demonstrate that hazardous materials handled and/or stored will be removed, disposed or reused in an appropriate manner.

- To properly close a facility, all hazardous materials must be removed from the facility. In some cases, equipment may be closed in place. Code QE and the regulatory agency will inspect the facility to determine if leakage has occurred and for potential impact to the ground surface beneath the building. In the event that leakage has occurred, samples will be collected for analysis by Code QE.

- Some facilities may leave large equipment in place, such as wind tunnels, pumps, motors, etc. Equipment to be left in place will require routine inspections to ensure that hazardous materials are not leaking from the equipment. All inspections must be documented. In the event of equipment leakage, personnel must contact Code QE to discuss the remedial measures that must be taken to ensure that leakage(s) have been mitigated and will not occur in the future.

For more information, you can contact Shelly Navarro at ext. 4-0926 or you can email her at: [sbnavarro@mail.arc.nasa.gov](mailto:sbnavarro@mail.arc.nasa.gov). Additionally, you can go to the Environmental Services Office, Code QE, web site at: <http://q.arc.nasa.gov/qe/>.

## Pioneer 10 just keeps on going!

*continued from front page*



*Celebrating contact with Pioneer 10 are (left to right) Paul Travis, Pioneer senior flight controller; Dr. Larry Lasher, Pioneer project manager; Dave Lozier, Pioneer flight director and Larry Kellogg, project flight technician.*

James Van Allen of the University of Iowa, who discovered the Earth's radiation belts bearing his name. Based on the previous data received, Van Allen concluded that galactic cosmic radiation is being moderated by the sun's influence, meaning Pioneer 10 has not yet crossed the boundary into interstellar space.

Further information about Pioneer 10 is available on the internet at: <http://spaceprojects.arc.nasa.gov/>

Geiger-tube telescope instrument are analyzed by original principal investigator Dr. [Space\\_Projects/pioneer/PNhome.html](http://Space_Projects/pioneer/PNhome.html)

BY MICHAEL MEWHINNEY ▲

# Get ready for electronic timekeeping system

Beginning this spring, Ames Research Center will implement WebTADS, a web-based time and attendance system that will replace our current time-reporting processes. This easy-to-use web-based system eliminates paper time sheets, automates leave requests and approvals, provides updated leave balances and allows for real time entry, eliminating the need to forecast time. This system, which will be utilized by all civil service employees, is accessible from anywhere, at any time and supports the agency-wide e-government initiative.

The system will be implemented over four pay periods beginning April 7. The phased implementation schedule is as follows:

- Pay period 1, 4/7 - 4/20 - Code C
- Pay period 2, 4/21-5/4 - Codes J,D,Q,N
- Pay period 3, 5/5-5/18 - Codes A, I
- Pay Period 4 5/19-6/1- Codes F, S

The WebTADS project team is committed to providing a variety of training options, outlined below, designed to help you learn about and use the system successfully. For more information on training courses and schedules, check the WebTADS web page at: <http://webtads.arc.nasa.gov>

## Comprehensive overviews

WebTADS comprehensive overviews for Ames staff begin on March 11. These overviews include an introduction to WebTADS, a detailed demonstration of the application and a review of the time and leave policies followed by a question and answer session. Supervisors attending the overview will receive leadership credit. Supervisors who haven't already scheduled a WebTADS com-

prehensive overview for their staff should do so soon. web page for registration instructions.



photo by Tom Trower

Members of the IFMP Steering Committee watch as Amber Sutton demonstrates WebTADS, the new time and attendance application. From left, Tom Moyles, Joan Salute, Amber Sutton, Bill Berry and Nancy Bingham.

## Hands-on systems training

Hands-on training starts April 15. This training is a 90-minute instructor-led class providing detailed instruction and practice on WebTADS. There is a customized 2-hour version of the systems training that will be offered to points of contact (POC) and approvers. Class sizes are limited so pick your date and register early. Additional classes will be added based on demand. See the March training announcement or the WebTADS

## Policy training

This training focuses on a comprehensive review of time and leave policies in an open forum setting. The purpose of this class is to review policies and outline the responsibilities of employees and supervisors.

## Drop in clinics

The WebTADS project team also will provide drop in clinics on the last Thursday and Friday of each pay period for anyone needing extra assistance completing or approving timesheets. The clinics will be held in Building 241 room 147 from April until June.

## Ames employees recognized

As part of its employee motivation program, NASA honors, through the Space Flight Awareness (SFA) honoree program, employees who have performed exemplary work in support of the space shuttle and space station programs and other space flight-related assignments. Selected honorees will have the opportunity to tour the Kennedy Space Center facilities, attend a reception in their honor and view a launch.

The SFA honoree award is one of the highest and most prestigious awards available to employees of the NASA industry,

shuttle/payloads team. The award and honoree activities are sponsored by the Office of Space Flight and the NASA/Industry Motivation Panel.

Ames recently had three honorees for STS-109 that launched on March 1, 2002. These were Robert G. Burney of the System Safety and Mission Assurance Office (Code QS); Stuart M. Jakabcin, Lockheed Martin Engineering Sciences, Space Projects Division (Code SF); and Cecilia L. Wigley of the Systems Development Branch (Code SFD).

# WebTADS

Feel free to drop in between 9:00 a.m. and 4:00 p.m. to learn how to use WebTADS and complete your timesheet.

If you have questions you can email them to: [webtads@mail.arc.nasa.gov](mailto:webtads@mail.arc.nasa.gov).

## Volcanic eruptions implicated in ozone hole creation

An 'ozone hole' could form over the North Pole after future major volcanic eruptions, according to the cover story by a NASA scientist in the March 5 edition of the Proceedings of the National Academy of Sciences.

Since the 1980s, a seasonal ozone hole, characterized by severe loss of ozone, has appeared over the continent of Antarctica. However, scientists have not yet observed, on an annual basis, as severe a thinning of the protective ozone layer in the atmosphere over the arctic. The ozone layer shields life on Earth from harmful ultraviolet radiation. A northern ozone hole could be significant since more people live in arctic regions than near the South Pole.

"A 'volcanic ozone hole' is likely to occur over the arctic within the next 30 years," said Ame's Azadeh Tabazadeh, lead author of the paper and scientist. Her co-authors are Katja Drdla, also of Ames; Mark R. Schoeberl of NASA's Goddard Space Flight Center, Greenbelt, Md.; Patrick Hamill of San José State University, Calif.; and O. Brian Toon from the University of Colorado, Boulder.

"If a period of high volcanic activity coincides with a series of cold arctic winters, then a springtime arctic ozone hole may reappear for a number of consecutive years, resembling the pattern seen in the antarctic every spring since the 1980s," Tabazadeh said.

"Unlike the antarctic, where it is cold every winter, the winter in the arctic stratosphere is highly variable," Tabazadeh said. NASA satellite and airborne observations show that significant arctic ozone loss occurs only following very cold winters, according to Tabazadeh.

Large volcanic eruptions pump sulfur

compounds into the Earth's atmosphere. These compounds form sulfuric acid clouds similar to polar stratospheric clouds made of nitric acid and water. The clouds of nitric acid and water form in the upper atmosphere during very cold conditions and play a major part in the destruction of ozone over Earth's poles. Following eruptions, volcanic sulfuric acid clouds would greatly add to the ozone-destroying power of polar stratospheric clouds, said Drdla.

"Volcanic aerosols also can cause ozone destruction at warmer temperatures than polar stratospheric clouds, and this would expand the area of ozone destruction over more populated areas," Tabazadeh said. "Nearly one-third of the total ozone depletion could be a result of volcanic aerosol effects at altitudes below about 17 kilometers (11.5 miles)," said the researcher.

"Volcanic emissions can spread worldwide," said Schoeberl. "Our Mt. Pinatubo computer simulation shows that the volcanic plume spread as far north as the North Pole in the lowest part of the stratosphere within a few months after the eruption."

Between about 15 and 25 kilometers (9 to 16 miles) in altitude, volcanic arctic clouds

could increase springtime ozone loss over the arctic by as much as 70 percent, according to Drdla. "The combination of thick volcanic aerosols at lower altitudes and natural



Polar stratospheric clouds over a Scandinavian landscape. These clouds, made of nitric acid and water, form in the upper atmosphere during very cold conditions and play a major role in the destruction of ozone over Earth's poles.

photo by NASA SOLVE Project

polar stratospheric clouds at higher altitudes could greatly increase the potential for ozone destruction over the North Pole in a cold year," Tabazadeh said.

"Both the 1982 El Chichon and 1991 Mt. Pinatubo eruptions were sulfur rich, producing volcanic clouds that lasted a number of years in the stratosphere," Tabazadeh said. The Pinatubo eruption, as observed by NASA spacecraft, widely expanded the area of ozone loss over the arctic.

Both of these eruptions did have an effect, however, over the South Pole, expanding the area and the depth of the ozone hole over the antarctic, according to Tabazadeh. Computer simulations have shown that the early and rapid growth of the antarctic ozone hole in the early 1980s may have been influenced in part by a number of large volcanic eruptions, she added.

"In 1993 the arctic winter was not one of the coldest winters on record, and yet the ozone loss was one of the greatest that we've seen," Tabazadeh said. "This was due to the sulfurous Pinatubo clouds facilitating the destruction of additional ozone at lower altitudes where polar stratospheric clouds cannot form."

"Climate change combined with aftereffects of large volcanic eruptions will contribute to more ozone loss over both poles," Tabazadeh said. "This research proves that ozone recovery is more complex than originally thought."

More information is available at: <http://www.gsfc.nasa.gov/topstory/20020304volcano.html>

BY JOHN BLUCK ▲

## Carlton James passes away

Carlton Starbuck James passed away this past November. James worked as an aeronautical research scientist at Ames, retiring in the 1970s. He was 81 at the time of his death.

James was born in Honolulu, on Aug. 27, 1920. James moved to California in 1925 and was active in the Boy Scouts throughout his youth. At 12, he began the construction of a mountain lodge, which he finished in his early twenties. He graduated from Stanford University with a degree in chemistry in February 1943.

During World War II, he was a second lieutenant in the Army Air Force, flying four-engine aircraft, commanding the crew and he was active in training other pilots.

In the 1950s, James sang with the West Bay Opera Association. Later in life, he was an active member of the Woodside Garden Club and Home Owners' Association. He

also was a member of the American Society for the Advancement of Chinese Art and was an opera enthusiast.

James later returned to Stanford University to take courses in aeronautical engineering and then started working at Ames. He married a fellow employee, Nataline Aquino, who died in October 1993. James also was a member of the Aeronautical Sciences, a member of Owl Feathers and served on the Committee of Art at Stanford University and also belonged to other scientific groups.

He is survived by his current wife, Vera; daughter, C. Lynne Douglas; granddaughters Sara and Rebeka; nieces and nephews Jean, Glen, Virginia, Matthew and Shawn; grand niece Vivian; former brother-in-law Giriraj; Vera's children and grandchildren Mary, Laura, Marshall, George, Ian and Arran and all his many friends.

## Disaster service worker seminar set

Larry Carr, auxiliary communication services (ACS) officer for Santa Clara County, will be at Ames on March 21 at 12 noon and will address the subject of the California Disaster Service Worker Volunteer program with an emphasis on volunteers desiring to support Ames and the surrounding communities in the area of communications.

The talk is being hosted as part of volunteer communications support activities provided to the center by the Ames Amateur Radio Club (AARC) and will be held at the center's amateur radio station (NA6MF) located in T28P, across from the N255 Supply Support Facility.

Disaster service worker registration protects volunteers from financial loss as a result of injuries that may be sustained while engaged in assigned service activities and provides an immunity from liability while providing these services.

Carr is one of only a few authorized individuals able to register disaster service workers for communications and will have the appropriate registration materials available for those interested in registering.

Information regarding this event, the Ames Amateur Radio Club and radio communications can be found on the club's web site located at: <http://hamradio.arc.nasa.gov>.

## New York City firefighter tours Ames

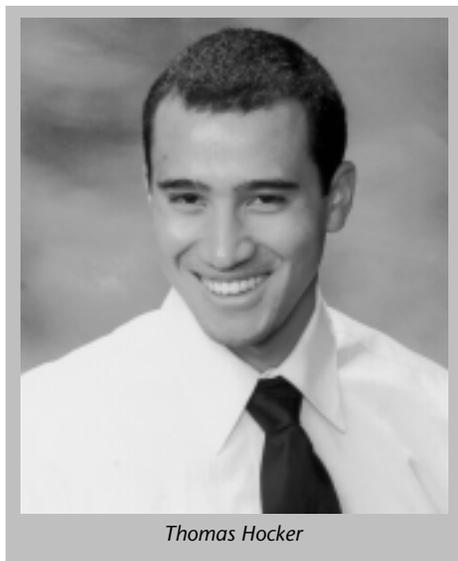


photo by Tom Trower

New York City firefighter Robert Schneider and his wife Lynn were recent visitors to Ames as guests of the City of Sunnysvale and Vice Mayor Julia Miller. The Schneiders visited FutureFlight Central, the Collapsed Structure Rescue Training Facility, the 747 simulator at the Crew Vehicle Systems Research Facility and the 80' by 120' wind tunnel.

## Hocker wins Cambridge University scholarship

Thomas Hocker, a senior at Yale University, New Haven, Conn., recently won the prestigious Churchill Scholarship to pursue



Thomas Hocker

graduate studies at Churchill College, University of Cambridge, in the United King-

dom. Hocker majors in molecular, cellular and developmental biology, is a Yale track-and-field star and is son of Andrew Hocker Jr. who works for Code Q.

The younger Hocker is one of 11 U.S. students to receive the scholarship this year from the Churchill Foundation. It devotes most of its resources to scholarships that enable American students who have exceptional ability to do graduate study in engineering, mathematics and the sciences at Cambridge. Some 41 institutions in the United States participate in the Churchill Scholarship program.

In his first year at Yale, Hocker traveled to Cambridge for a track competition between a combined Yale-Harvard team and a Cambridge-Oxford team. At that meet he won the 110-meter high hurdles and the 400-meter intermediate hurdles.

"He was impressed with the overall environment at Cambridge," his father said. "I was not really surprised that he considered post-graduate work at Cambridge."

The scholarship includes one year of tuition and fees, worth about \$15,000, as well

as a \$9,000-\$11,000 living allowance and \$500 for travel.

Beyond Cambridge, Hocker plans to return stateside to pursue post-graduate study for a MD/Ph.D. in molecular, cellular and developmental biology.

Earlier, he achieved a near-perfect score of 41 out of 43 on his initial attempt of the Medical College Admission Test (MCAT). The MCAT program office offered him a part-time position as a regional tutor.

His athletic achievements include a 2001 first-team All-Ivy performance in the 400-meter hurdles and the 1,600-meter relay. He also earned All-East in hurdles last spring and first-team, all-league honors for the indoor, one-mile relay event last winter. He was All-East and first-team, All-Ivy in the 4x400 relay when he was a sophomore.

In addition, he was the 2001 Verizon Second-Team Academic All-America, and made Verizon's first-team All-District. He was also named Academic All-Ivy.

BY JOHN BLUCK 

# Event Calendar

**Model HO/HOn3 Railroad Train Club** at Moffett Field in Bldg. 126, across from the south end of Hangar One. Work nights are usually Friday nights, 7:30 p.m. to 9:30 p.m. Play time is Sundays, 2 p.m. to 4 p.m. Call John Donovan (408) 735-4954 (W) or (408) 281-2899 (H).

**Jetstream Toastmasters**, Mondays, 12 noon to 1 p.m., N-269/Rm. 179. Guests welcome. POC: Cathy Payne at ext. 4-0003.

**Ames Ballroom Dance Club.** Classes meet Tuesdays. Mar. 19 and 26, waltz. Begin classes start at 6:15 p.m. Higher-level class meets at 5:15 p.m. Held in Bldg. 944, the Recreation Center. POC: Helen Hwang, hwang@dm1.arc.nasa.gov.

**Ames Bowling League.** Palo Alto Bowl on Tues. nights. Seeking full-time bowlers and substitutes. Pre-league meeting at Palo Alto Bowl on Tues, August 28 at 6 p.m. Questions to sign up: Mike Liu at ext. 4-1132.

**Ames Diabetics (AAD),** 1st & 3rd Weds, 12 noon to 1 p.m., at Ames Mega Bites, Sun rm. Support group discusses news affecting diabetics. POC: Bob Mohlenhoff, ext. 4-2523/email at: bmohlenhoff@mail.arc.nasa.gov.

**Ames Child Care Center Board of Directors Mtg.** Every other Thursday (check web site for meeting dates: <http://accr.arc.nasa.gov>), 12 noon to 2 p.m., N-269, Rm. 201. POC: Joan Walton, ext 4-2005.

**Ames Federal Employees Union (AFEU) Mtg.** Mar. 20, 12 p.m. to 1 p.m., Bldg. 19, Rm 1042. Info at: <http://www.afeu.org>. POC: Marianne Mosher at ext. 4-4055.

**Ames Amateur Radio Club,** Mar. 21, 12 noon, N-T28 (across from N-255). POC: Michael Wright, KG6BFK, at ext. 4-6262. URL: <http://hamradio.arc.nasa.gov>.

**Native American Advisory Committee Mtg, Mar. 26,** 12 noon to 1 p.m., Building 19, Rm 1096. POC: Mike Liu at ext. 4-1132.

**Ames Contractor Council Mtg,** Apr. 3, 11 a.m., N-200, Comm. Rm. POC: Paul Chaplin at ext. 4-3262.

**Environmental, Health and Safety Information Forum,** Apr. 4, 8:30 a.m. to 9:30 a.m., Bldg. 19/Rm 1040. URL: <http://q.arc.nasa.gov/qe/events/EHSSeries/> POC: Julie Quanz at ext. 4-6810.

**Environmental, Health and Safety Information Forum,** Apr. 4, 8:30 a.m. to 9:30 a.m., Bldg. 19/Rm 1040. URL: <http://q.arc.nasa.gov/qe/events/EHSSeries/> POC: Julie Quanz at ext. 4-6810.

**Nat'l Association of Retired Federal Employees, (NARFE),** Apr. 5, S. J. Chptr #50 mtg, 9:30 a.m., Hometown Buffet, Westgate Mall, 4735 Hamilton Avenue., San José. Program at 10 a.m. 'Guide Dogs for the Blind.' Lunch at 11 a.m. \$6.27 pp. POC: Earl Keener (408) 241-4459 or NARFE 1-800-627-3394.

## Ames Classifieds

Ads for the next issue should be sent to [astrogram@mail.arc.nasa.gov](mailto:astrogram@mail.arc.nasa.gov) by the first Friday 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 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.

### Housing

Duplex for lease: 2bd/1ba, garage and large back yard. Pet OK. In Mt.View 5 min. to Ames. \$1,500 and deposit. Avail April 1. Long (650) 962-8728.

Great Santa Clara duplex. Must see, 3 bd/2 ba, w/d hook-ups, 2 car garage, central heat/ac, backyard. 10 miles from Ames. \$2,400/month w/ \$2,000 deposit. Available April 1st. Connie or Joe (408) 246-5295.

Room with large closet in 4bd/2 ba home excellent, quiet Mtn View area close to Ames. W/D, microwave, fireplace. Tidy person & nonsmoker. Easy access to Ames, H85, H237, & H101. \$475 + share utilities. Avail. 4/1. Call (650) 964-1900.

Ames intern from Netherlands looking for reasonable, furnished housing for time period 8/1 - 11/1. Please contact via email at: [J.R.Remy@tue.nl](mailto:J.R.Remy@tue.nl)

Furnished studio in S. Palo Alto, near San Antonio/Alma, 2 exits from Ames, private entrance, N/S, 1st/last, \$600 rent includes utilities. Call (650) 493-5491.

Roommate wanted (N/S, prof) to share a great, sunny, 2 mstr bd/2 ba end-unit condo (Sunnyvale) with gar, W/D, large rooms, storage, central air, low utilities, jac, great pool, balcony, 3 mi from Ames, \$900 plus 1/2 util's (potential to reduce rent with lease). Alan (408) 830-0755 (H); cell: (408) 348-3564.

### Miscellaneous

Refrigerator, 26 cubic ft. Great condition, with electronic controls, water and ice dispenser. Black, with side by side freezer. \$375, originally \$1,600. Call (650) 903-9461, lv msg.

Baby clothes/items; lots of infant-12 mth. boy clothes, swing, bouncer, walker & other misc. items. All in excellent condition. Call (408) 365-7575.

Adobe GoLive 5.0 for the Mac, professional web authoring and site management, unopened, still in shrink wrap, \$250 or B/O. Call (408) 377-8671.

6400 PowerMac, oldie but a goody, everything but the monitor, great condition, \$100. 29in. truck tires w/ steel wheels, 6 lug, plenty of tread, best offer. Fire extinguishers, all types, empty, best offer. Call (408) 377-8671.

Moving - need to sell the following items: toddler bed, changing table, furniture, exercise equipment, clothing, appliances. Sarah (408) 593-1373.

Ovation 12-string acoustic-electric guitar. Perfect condition. \$700. Email Bob Gisler: [rgisler@mindspring.com](mailto:rgisler@mindspring.com)

### Transportation

'70 VW convertible classic. Like to restore VW's? Take me home. Original owner, no smog needed, transmission ok, needs work on top & possibly engine. Only \$1,200. Esther or Art (650) 961-2732.

'72 Ford Ranchero, red w/302 Windsor. Body bumped up & needs timing chain & choke. Crager mag wheels, new battery & tires. \$800. Jim (408) 988-0750.

'91 Honda Accord LX Wagon-4D, burgundy, 4 cylinder, automatic, air conditioning, power steering/windows/door locks. Excellent Condition, low mileage, \$5,050. Call (408) 735-1807.

'93 Ford Taurus, 69K, 3.8L, automatic, power windows/locks, tilt wheel, cruise control, good body, tires and battery, new rear brakes, needs work, \$1,200 or B/O. Dave (408) 257-9041 after 6 p.m.

'94 Infiniti J30, auto, dark green, gold package, loaded, Bose sound sys, leather interior \$8,400. Call (408) 733-1906.

'96 Buick Roadmaster Estate Wagon, loaded 108k mls, \$11,500 or B/O. Call (408) 253-8004.

'98 Ford Ranger XLT, ext cab, automatic, V6 3.0, AC, Vista camper shell, carpet kit, AM/FM stereo, cassette, 25K mls, \$10,500 or B/O. Deanna (408) 260-1180 between 5-9 p.m.

'99 Honda CRV LX, white, 60K mls, automatic. \$16,000 or B/O. Call (408) 506-2542.

'00 Chevy Impala, assume lease or purchase, 18 months left on lease. Full power, P-front seats, cd, pw, abs-brakes, tilt wheel, LS suspension, 4w-disc brakes, 3 on board computers, auto rear view mirror. Bob (408) 736-4039.

### Lost and Found

A pearl necklace was found in the N240-A premises. Call Frances Acosta at ext. 4-0172 to claim.

Found: one gold earring in tower parking lot. Call (408) 294-6164 to identify.

## Astrogram deadlines

All Ames employees are invited to submit articles relating to Ames projects and activities for publication. When submitting stories or ads for, 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:
Fri, Mar. 15	Mon, Mar. 25
Fri, Mar. 29	Mon, Apr. 8
Fri, Apr. 12	Mon, Apr. 22
Fri, Apr. 26	Mon, May 6

### Ames Public Radio

1700 KHz AM radio -- information announcements and emergency instructions, when appropriate, for Ames employees. The emergency information phone number for Ames is (650) 604-9999.

## 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 N-235 (8 a.m. to 2 p.m.)**  
ext. 4-6873

Ask about NASA customized gifts for special occasions. Make your reservations for Chase Park.

**Mega Bites N-235 (6 a.m. to 2 p.m.)**  
ext. 4-5969

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

**Visitor Center Gift Shop N-223**  
(10 a.m. to 4:00 p.m.) ext. 4-5412

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

**Tickets, etc...(N-235, 8 a.m. to 2 p.m.)**  
ext. 4-6873

Check web site for discounts to local attractions, <http://exchange.arc.nasa.gov> and click on tickets. Mar. 23, 8 p.m., Joseph & The Dream Coat, San Jose Center for the Performing Arts

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

Open 7 days a week, 7:00 a.m. to 10 p.m. Rates from \$40 - \$50.

### Vacation Opportunities

Lake Tahoe-Squaw Valley townhs, 3 bd/2ba, view of slopes, close to lifts. Wknd \$500, midwk \$190 nite. Included lines, cleaning, propane fireplace, fully furnished. Call (650) 968-4155. [DBMcKellar@aol.com](mailto:DBMcKellar@aol.com)

South Lake Tahoe Cottage w/wood fireplace and hot tub. Rates from \$50 to \$130 per night. Call (650) 967-7659 or (650) 704-7732.

Vacation rental, Bass Lake CA 14 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 lovely canyon setting. Fully eqpd kitchen. Access to priv. beach. Tub in patio gdn. Halfway between Carmel & Big Sur. \$175/night for 2; \$225 for 4 and \$250 for more, plus \$150 cleaning dep. Call (650) 328-4427.

Incline Village: Forest Pines, Lake Tahoe condo, 3 bd/2 ba, sleeps 8. Fireplace, TV/VCR, MW, W/D, jacuzzi, sauna, pool. \$120/night low season; \$155/night high season. \$90 cleaning fee and 12% Nevada room tax. Charlie (650) 366-1873.

## Computer History Museum four hours extended

There are exciting changes underway at the Computer History Museum. As of Mar. 2, the Visible Storage Exhibit Area has extended

area also will be open for tours on Wednesdays at 1:30 p.m. and Fridays at 1:00 p.m. For more information, or to schedule a

tour, call ext. 4-2579 or visit the web at: [www.computerhistory.org](http://www.computerhistory.org). You also can e-mail to: [Sweeney@computerhistory.org](mailto:Sweeney@computerhistory.org)



its hours for public tours. The tours will be available on the first and third Saturdays at 1:00 p.m. and 2:00 p.m.

Access to Moffett Field also is easier. Visitors no longer need to go to the badging office before entering the base. Drivers must show valid driver license to the security officers at the main gate and tell them they are going to the Computer History Museum and they will let you in.

We are very excited about this opportunity to make our collection more accessible to the public. We continue to be committed to the preservation and celebration of computing history.

The Visible Storage Exhibit Area is located in building 126 at Moffett. As always, the

## New software accelerates CFD speed

The computational fluid dynamics (CFD) cycle time just got shorter with the newly improved Pegasus5 code. Co-developer Stuart Rogers, an aerospace engineer in the NASA Advanced Supercomputing Division at Ames, recently applied this code to a difficult and complex configuration -- a complete Boeing 777-200 high-lift aircraft.

Starting with an existing volume grids, Rogers was able to construct the entire overset grid system in only three days -- a calculation that took 32 days to accomplish in 1998 using the previous version of the software, Pegasus4.

"This speedup in CFD cycle time and reduction in user expertise requirements will significantly reduce the cost of applying viscous CFD methods to complex design and analysis problems," Rogers said.

The Pegasus5 software is used to perform the preprocessing task of linking together a large number of randomly overset grids. All that is required to use Pegasus5 is the OVERFLOW input file and the volume grids.

During the past year, significant enhancements were made to the software, including algorithm improvements, bug fixes and parallelization. It is these advances that en-

able Pegasus5 to perform calculations days sooner than Pegasus4.

Rogers plans to continue enhancements on the most recent version of Pegasus, making additional algorithm improvements to increase the code's automation and robustness.

For more information about the Pegasus5 software, contact Stuart Rogers at [rogers@nas.nasa.gov](mailto:rogers@nas.nasa.gov).

BY HOLLY A. AMUNDSON ▲



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

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