

The Ames Astrogram

Communication for the Information Technology Age

December 17, 2001



"The past year was a challenging one — for NASA, for Ames Research Center and for our nation. We experienced concerns about programs, funding and changes in administration. Still, nothing prepared us for the tragic events of September 11, which brought everything back into focus and perspective.

During this season of celebration, family togetherness and personal renewal, I encourage you to reflect on everything we have to be thankful for — our strong institutions, free country and resiliency as a people. Regardless of your beliefs, may you draw strength and hope from the things we often take for granted, but which sustain and nurture us all on a daily basis."

— Henry McDonald, Center Director

Center Briefs

Chandra captures Venus in a whole new light

Scientists have captured the first X-ray view of Venus using NASA's Chandra X-ray observatory. The observations provide new information about the atmosphere of Venus and open a new window for examining Earth's sister planet.

Venus in X-rays looks similar to Venus in visible light, but there are important differences. The optically visible Venus is due to the reflection of sunlight and, for the relative positions of Venus, Earth and sun during these observations, shows a uniform half-crescent that is brightest toward the middle. The X-ray Venus is slightly less than a half-crescent and brighter on the limbs.

Centennial of Flight Commission and Aviation World's Fair join hands

The U.S. Centennial of Flight Commission and the Aviation World's Fair have signed a memorandum of agreement that will allow them to jointly promote in 2003 the celebration of the 100th anniversary of the first powered flight.

The fair will be held at the Newport News-Williamsburg International Airport April 7-27, 2003, and will be the most comprehensive international event promoting the birth of the aviation industry.

Olsen to be named Associate Director of Science and Technology Policy

On Dec. 5, the White House announced that Kathie L. Olsen will be nominated to be associate director of the Office of Science and Technology Policy.

Olsen has been chief scientist at NASA since May 1999 and acting associate administrator for the Office of Biological and Physical Research since July 2000. She worked at the National Science Foundation from 1984 to 1996, returning to NASA in 1997.

Gregory named Acting Associate Administrator for Space Flight

Frederick D. Gregory, an astronaut and the senior executive currently responsible for the safety and reliability of all agency programs, has been named acting associate administrator for the Office of Space Flight.

Gregory, 60, is currently associate administrator for the Office of Safety and Mission Assurance at NASA Headquarters in Washington. He will replace Joseph H. Rothenberg, who retires Dec. 15.

"Safety permeates everything Fred does. He's the right person for this job," said Acting NASA Administrator Dr. Daniel R. Mulville. "His experience as an astronaut, pilot and manager of flight safety programs is essential during this period of transition for the Office of Space Flight."

NASA biotechnology project may advance cancer research

Advanced technology development projects that may hold the key to detecting cancer while it affects only a few cells are getting underway at Ames.

Ames has awarded grants totaling \$1.286 million to support 11 peer-reviewed, in-house research projects. The grants are the first step in implementing a NASA/National Cancer Institute (NCI) partnership known as Fundamental Technologies for the Development of Biomolecular Sensors. Both agencies expect program research to lead to important benefits. Ames is leading NASA's efforts in this new endeavor.

"The development of cutting-edge sensors, technologies and instruments should enable advances in biological research and human space exploration," noted John Hines, manager of the NASA Biomolecular Physics and Chemistry Program, which administers the NASA element of the collaboration. The goal of the program is to develop new molecular signatures and ways to identify molecular indications of cancer and other diseases.

"This intramural research program establishes a foundation for supporting the NASA/NCI collaboration," Hines said. "We look forward to its swift execution and the validation of emerging biomolecular technologies for future NASA missions."

Research in biomolecular systems is expected to yield breakthrough technologies for minimally invasive health monitoring, early disease detection, and targeted delivery of medication--benefits of interest to both organizations.

Hines noted that there is considerable overlap in the needs of NASA and NCI for biomolecular sensors. NASA needs sensors for the diagnosis and treatment of injury, illness and emerging diseases in astronauts during long-duration space flights; for monitoring and control of life support systems; and for the remote sensing of signatures of life on distant planetary bodies. NCI needs technologies that will enable detection of the earliest stages of cancer and provide rapid and specific treatment.

The grants will support NASA research in biosensor development, high-resolution sampling of biological specimens, a new ultra-sensitive technique for detecting organisms and their biomarkers and detection of microorganisms on sterilized surfaces.

Awardees come from the life sciences, information technology, astrobiology and aerospace fields at Ames. The winning intramural proposals were selected from 41 re-

ceived from Ames and NASA's Jet Propulsion Laboratory (JPL), Pasadena, Calif., which received five additional grants. Dr. Darrell Jan of JPL will serve as deputy program manager.

The development of microscopic explorers that can travel through the human body in search of disease would allow NASA to monitor astronaut health in space, where medical test capabilities and communication with Earth may be limited. New technologies also could revolutionize the speed and effectiveness of basic health care on Earth through early detection, diagnosis and treatment of cancer.

The ability to identify changes such as protein expression or gene expression that will develop into cancer at a later date may enable scientists to develop therapies to attack these cells before the disease spreads.

"With molecular technologies, we may be able to understand the molecular signatures within a cell using the fusion of biotechnology, nanotechnology and information technology," Hines said. Ames is a leader in all three fields of research.

Currently, cancer can be detected only after it has developed into a tumor or has affected a large number of cells. Chemotherapy or radiation treatment can do significant damage to healthy cells far-removed from the cancer. If scientists can detect the disease before it affects a larger area, or even before the pre-cancerous cells become malignant, they may be able to design treatments that target only the affected cells, eliminating potential damage to other areas of the body.

Ames will focus on six key areas in molecular and cellular biology and associated technologies. Biomolecular sensors may some day be able to kill tumor cells or provide targeted delivery of medication. Molecular imaging may help scientists understand how genes are expressed and how they control cells. Developments in signal amplification could make monitoring and measurement of target molecules easier. Biosignatures--identification of signatures of life--offer the possibility of distinguishing cancerous cells from healthy cells. Information processing (bioinformatics) will use pattern recognition and modeling of biological behavior and processes to assess physiological conditions. Finally, molecular-based sensors and instrumentation systems will provide an invaluable aid to meeting NASA and NCI objectives.

NASA is supporting the program with \$10 million over 5 years. NCI's contribution

continued on next page

2001 'Spinoff' publication now available

The Commercial Technology Office has recently received a shipment of the 2001 issue of NASA Spinoff.

For the past 28 years, this magazine has been published annually to promote NASA research and development efforts and commercialization success stories. The application of NASA technology helps the U.S. meet international competitive challenges and stay at the leading edge of technical innovation. The return benefits--'spinoffs'--represent a significant dividend to the taxpayer and the nation's investment in aerospace research.

Spinoff 2001 is an instrument of the NASA commercial technology program and documents the outcome of NASA spinoff successes. It is a true measurement of NASA's commitment to transfer as many technologies to the private sector as possible.

In addition, this year highlights the activities of the past several years. This issue is a special millennium feature. There are three

main categories of the publication: aerospace research and development, commer-

cial benefits and technology transfer and outreach. Former NASA Administrator Daniel Goldin said, "This publication is full of examples of the innovation of our private sector. It is this innovation that keeps America at the forefront of scientific and technical leadership. Many of the examples in this publication are surprising, many are inspiring; all are interesting and indicative of the wealth and breadth of our collective genius."

To obtain a copy of the Spinoff publication, send an email to Lisa Williams at: liwilliams@mail.arc.nasa.gov



NASA project to advance cancer research

continued from previous page

is \$10 million or more. In addition to the intramural efforts, the agencies have issued a joint extramural solicitation. Each organization will fund proposals of interest to it, with no exchange of funds between the organizations. The two agencies will jointly monitor the technical progress of all funded activities and conduct joint reviews.

NASA's participation in the collaboration is supported by the agency's Office of Biological and Physical Research, which promotes basic and applied research to support human exploration of space and to take advantage of the space environment as a laboratory. More information is available at: <http://spaceresearch.nasa.gov/>

"Our goal is to really make this an applied program and to facilitate the identification and incubation of these advanced technologies, and to transfer them efficiently to NASA and NCI programs," Hines said. More information about this program is available at: <http://astrobionics.arc.nasa.gov/>

BY ANN HUTCHISON

VPP STAR Tip:

Both the requirements for the VPP and the methods by which the government determines if the requirements are met have pushed VPP employee involvement to the cutting edge in safety and health. Employees are expected to be actively and meaningfully involved in the structure and operation of the safety and health program.

...Margaret Richardson, in Preparing for the Voluntary Protection Programs, Copyright © 1999 by John Wiley & Sons, Inc. Reprinted by permission.

Ames Occupational illness/injury data

	Civil Servants	Contractors
Not recordable first aid cases	3	2
Recordable no lost time cases	1	0
Restricted workday cases	0	0
Lost workday cases	0	0

These data were correct at the time of publication. They may be subject to slight adjustment due to late reporting.

Computer History Museum announces 'Beta Building'

The Computer History Museum, repository of one of the world's largest collections of computing artifacts, unveiled plans on Dec. 7 to build a 41,000-square-foot facility near historic Hangar One in the proposed NASA Research Park.

NASA Ames Center Director Dr. Henry McDonald and Computer History Museum Executive Director and CEO John C. Toole headed a panel discussion about the museum's role in the NASA Research Park and plans for the new facility. Other distinguished panelists included Leonard J. Shustek, chairman of the board of trustees of the Computer History Museum; Donna Dubinsky, museum trustee and CEO of HandSpring, Inc., Mountain View, Calif.; and Bill Campbell, chairman of the board, Intuit,



Center Director Henry McDonald chats with Congresswoman Zoe Lofgren, Representative for California's 16th District.

Inc., Mountain View, Calif.

"Our goal is to develop a world-class, shared-use R&D campus by partnering with industry, academia and cultural institutions in the NASA Research Park," McDonald said. "I am delighted to further this partnership with the Computer History Museum, a unique and important international resource for research and understanding of the origins and evolution of information technology."

Scheduled to open next summer, the temporary facility will be called 'The Beta Building,' in reference to a computer industry term for a product in its early phases and an indication that there is more to come, a prelude to the museum's permanent facility scheduled to open in 2005. Formerly known as The Computer Museum History Center, the renamed Computer History Museum also has a new logo, depicting the history of computing.

When the 41,000-square-foot Beta Building is completed, it will contain 22,500 square feet for artifact storage; 9,000 square feet for exhibits and events; and 9,500 square feet of office space. The Beta Building will double the museum's current storage space and allow it to increase its collection.

According to Shustek, the Beta Building

will allow the museum to increase its public presence in Silicon Valley. "For the past few years, museum staff, collection, exhibits and programs have been located in five, distributed buildings at Moffett Field. The Beta Building will allow us to consolidate into one



photos by Eric James
Executive Assistant Jack Boyd (left) and Center Director McDonald (right) chat with former NASA Administrator Daniel S. Goldin.

main space while the permanent building process is completed. We believe that opening the temporary space before the permanent museum opens in 2005 will enable more of the public to experience the artifacts and stories of a technological revolution that has changed the world."

"The museum is moving toward a new level of public exposure for the community, the nation and the world," said Toole. "The Beta Building will give us an opportunity to expand our operations for several years and manage a dynamic process to collect the stories and artifacts of the information age."

At the news conference, museum officials also announced the appointment of Head Curator Michael R. Williams, an internationally renowned computer historian. A recipient of numerous honors and awards, Williams has published many works during his 30-year career as an educator and curator at several different universities and at the National Museum of American History (Smithsonian Institution).

Daniel, Mann, Johnson, Mendenhall, Holmes and Narver, an architecture, engineering, and construction services firm, will design the museum's Beta Building. Esherrick, Homsey, Dodge & Davis, an architecture, interior design and graphic design firm, will design the museum's permanent facility. Premier museum exhibit design firm Van Sickle and Roller, of Medford, N. J., will help design the new museum's exhibits.

The Computer History Museum is an international resource for in-depth information about the history of computing. Its five

separate collections contain over 50,000 individual objects, including hardware, films, photographs and historical software, as well as extensive document archives. The museum is one of the leading partners in the proposed NASA Research Park. It will soon

break ground for its permanent facility in front of historic Hangar One.

Ames recently announced the Environmental Impact Statement process under the National Environmental Policy Act regulations to develop the land at Moffett Field under NASA ownership. The proposed developments include the area called the NASA Research Park in which the academic, industry and nonprofit partners hope to conduct their collaborative

research and education programs. Upon the successful completion of the environmental review processes, a land use agreement may be signed and construction of the



Panel members address attendees at the recent 'Beta Building' announcement event.

museum's permanent building may begin.

In addition to a permanent home for the Computer History Museum, NASA Research Park also will house facilities for the Carl Sagan Center for the Study of Life in the Cosmos; Carnegie Mellon University's School of Computer Science; the University of California at Santa Cruz; San José State University's Metropolitan Technology Center; and the California Air and Space Center.

For further details, see the museum's web site at: <http://www.computerhistory.org>

BY MICHAEL MEWHINNEY

Ames helps map sharpshooter insect habitats

NASA satellite and aerial images of California's Monterey County vineyards are helping local officials identify vineyards at risk of invasion by the glassy-winged sharpshooter insect pest.

The gluttonous pest has caused widespread damage to Southern California's vineyards, but has not yet invaded Monterey County. The glassy-winged sharpshooter is blue-green, about a half-inch long and is famous for a stylus-like drill that the insect uses to draw moisture from plants.

"We're using remotely sensed imagery to map vineyards and other sharpshooter habitats," said Lee Johnson, a California State University, Monterey Bay (CSUMB) research scientist. Johnson is based at Ames and is technical advisor for the effort. The pest often lives in orchards and along riverbanks, ditches and ponds and may threaten adjacent vineyards. "The maps will be used to determine the most effective places for agricultural officials to place traps to monitor for the sharpshooter," Johnson said.

"We created a defense map for the Monterey County Agriculture Commissioner's Office to combat any invasion by the sharpshooter," said Bay Area Shared Information Consortium (BASIC) president David Etter. "We identified the habitats of these rascals. They like to hang out on stream banks, in citrus groves and even in oak groves," he said. The insect sucks moisture from the heavy stalk of grapevines, and in the process can deposit a bacterium that causes Pierce's disease. Afflicted plants are unable to draw ground moisture or nutrients, Etter said. The plant then dies.

"Each adult glassy-winged sharpshooter sucks out 200 to 300 times its body weight in water every day. This is equivalent to an adult human drinking 4,300 gallons (16,340 liters) of water per day," said Dr. U Win, author of a report about the project to map the pest's potential habitats. He also is a research associate at the CSUMB Spatial Information, Visualization and Analysis Resources (CSUMB-SIVA) Center.

The pest feeds on more than 70 species of plants and is active all year. In addition to grapevines, the sharpshooter lives on citrus, avocado, macadamia, eucalyptus, crape myrtle, oleander, oak, sycamore, sumac and other plants. As of now, the insect has infested the entire counties of Los Angeles, Orange, Riverside, San Bernardino, San Diego, Ventura and parts of Butte, Contra Costa, Fresno, Kern, Imperial, Sacramento, Santa Barbara and Tulare counties, according to Win.

"The Agriculture Commissioner's Office will place insect traps strategically in the sharpshooter habitats, and mark their positions on our maps with global positioning system (GPS) technology," Etter said. The maps will make it easy to identify which vineyards are most vulnerable should there be a sharpshooter invasion, officials said.

The researchers combined LANDSAT satellite pictures with high-altitude aerial photos, and verified types of plants depicted by using ground-gathered data to make an accurate computerized map of the vineyards, orchards and other areas under study. "Ground-truthing" was essential for the verification of what was identified to be on the image and what was really on the ground," said Win.

Researchers can detect vineyards, citrus orchards, oaks, eucalyptus, avocados, cacti and ornamental vegetation, as well as riverbanks, ditches and pond shores where the pest may live. Scientists can put bright colors on the digital maps to clearly show different kinds of plants by using different colors for different species.

The pilot project took place from March until October this year. There are about 46,000 acres of vineyards in the Salinas Val-

ley that generate about a half-billion-dollar grape-wine economy.

"The pilot area covers approximately 15 percent of the Salinas Valley and 10 percent of the total vineyard acreage in the Salinas Valley," Win said.

"Mapping county-wide vineyards and other potential glassy-winged sharpshooter habitats is being considered for the next phase."

BASIC sponsored the sharpshooter work with funding from the NASA Earth Science Enterprise. BASIC worked with the CSUMB-SIVA Center to carry out the project in collaboration with the Monterey County Agriculture Commissioner's Office.

More information about the sharpshooter pest is on the Internet at:

<http://plant.cdpa.ca.gov/gwss> and at: <http://www.basic.org>

BY JOHN BLUCK 

SDB Forum held at Ames

On Nov. 15, Ames hosted its biennial Small Disadvantaged Business (SDB) Forum

College and Universities (HBCUs) participated in the forum: (1) Innovation Technologies,



Ames small business specialist Tom Kolis discusses the NASA plan to award 8 percent of prime and subcontracts to socially and economically disadvantaged businesses.

at the Moffett Training and Conference Center. This was the twenty-ninth in a series held at the various NASA research centers. The purpose of the forum is to allow highly qualified, high-tech SDBs and minority education institutions to present their capabilities and address questions from a technically oriented audience.

The following SDBs and Historically Black

College and Universities (HBCUs) participated in the forum: (1) Innovation Technologies, Inc., Novi, Mich., whose expertise includes advanced engineering and information technologies R&D; (2) Analytical Mechanics Associates, Inc., Hampton, Va., whose capabilities are in aerospace R&D, integrated software systems design; (3) Vecna Technologies, Inc., Hyattsville, Md., a firm with capability in intelligent software and systems--consultation, design and development; and (4) W de Y Associates, Inc. teaming with Texas Southern University (an HBCU), Houston. Together, they bring expertise in engineering and scientific technology; special instruments repair-calibration; biotechnology in molecular biology and tissue culture; and cardiovascular space physiology at cellular and molecular levels.

Anila Strahan served as the representative of the Associate Administrator, Office of Small and Disadvantaged Business Utilization, NASA Headquarters. Ames' Deputy Director William Berry provided the audience with his insights regarding the Ames socioeconomic contracting program.

New airborne observatory exhibit opens at Ames

A new exhibit featuring an actual wind tunnel model of the Stratospheric Observatory for Infrared Astronomy (SOFIA) opened Dec. 11 in Ames' Visitor Center. The free exhibit is open to the public Monday through Friday from 8 a.m. to 4:30 p.m. PST.

SOFIA is an astronomical observatory that will conduct observations beginning in 2004 at an altitude of about 41,000 feet aboard a modified Boeing 747SP aircraft operated and maintained by United Airlines. While using airborne telescopes is not new, SOFIA will be the world's largest and most powerful, considerably larger and more sophisticated than its predecessor, the Kuiper Airborne Observatory that was based at Ames from 1971 to 1995. SOFIA will feature a 98.4-inch (2.5 meter) telescope located behind a door that will open to the atmosphere, permitting observation of planets, stars and other phenomena.

"This very accurate model of a 747 spent hundreds of hours inside a wind tunnel at Ames, helping NASA engineers understand how an open cavity in the side of the airplane would affect its flight characteristics," explained Mike Bennett, SOFIA education and public outreach. "Now, in a wonderful example of creative recycling, the model is embarking on a second career in education. In the

future, it will help thousands of students and other visitors understand more about the many different kinds of technologies that

airflow over the telescope's open door in the aircraft's fuselage. Engineers studied the amount of airflow over and into the cavity when the observatory's telescope door is open; the effects of varying wind pressure on various parts of the telescope when the door is open; and the effects of the disturbed air flow on the aircraft's tail surfaces.

As a result of the wind tunnel tests, engineers developed a unique design for the telescope's aperture (the opening through which the telescope looks). On most observatories, the aperture is simply a round hole about the same size as the front of the telescope. However, on SOFIA, the aperture is modified by the addition of an 'aft ramp,' a sort of wind scoop located on the end of the aperture's assembly.

Normally, as air flows over the open cavity, it tends to drop down into the hole, creating turbulence and varying pressures inside the telescope cavity. However, with the ad-

dition of the specially designed aft ramp, just the right amount of the airflow was lifted back out, creating smoother airflow across the face of the opening and less turbulence inside the cavity. Air turbulence inside the cavity creates small vibrations and distur-

continued on back page



photo by Tom Trower

New exhibit of the wind tunnel model of the Stratospheric Observatory for Infrared Astronomy (SOFIA) displayed at the Ames Visitor Center.

modern scientists use to study the universe," he explained.

To determine how SOFIA will fly, Ames aerospace engineers tested the one-fourteenth scale model featured in the exhibit for more than 100 hours in Ames' 14-foot wind tunnel. Their purpose was to study the

Kids learn while celebrating at Ames' 'Aero Expo'



photos by Tom Trower

World War II Tuskegee airman addresses 1,200 students

As part of two days of 'Aero Expo' events celebrating a century of flight, a World War II 'Tuskegee Airman,' retired Air Force Lt. Col.

jeffersona.html

Tuskegee Airmen web sites are at: <http://members.aol.com/jtomlin228/latai/> and

In addition, in the flight support facility hangar, students viewed exhibits including NASA's Starship 2040, a traveling space transportation exhibit managed by the Marshall Space Flight Center, Huntsville, Ala. Housed in a 48-foot (14.6 meter) trailer, the exhibit is designed to share NASA's vision of what commercial space flight might be like 40 years from now.

"The main objective of Aero Expo is to develop the excitement and enthusiasm of youth to follow a technical career path, and in particular to excite them in the pursuit of aviation," said Robert Jacobsen, Ames' Director of the Air Space Systems Program that sponsored the educational event. Other aims were to provide teachers with aeronautics-related classroom activities and lesson plans to help provoke thought among students and educators about the Centennial of Flight in 2003.

"We want students to get excited and interested in mathematics and science," said Laura Shawnee of Ames' Education Office.

The event attracted enough attention that it had to be increased from one day to two days, according to Antoinette Battiste, an Aero Expo organizer. The following San Francisco Bay area cities and school districts sent students to the Aero Expo: San Francisco Unified; Palo Alto Unified; Cupertino Union; Fremont Unified; La Honda/Pescadero Unified; Oakland Unified; Hayward Unified; Santa Clara Unified; Evergreen, San Jose;



Col. Alexander Jefferson (left) and Ames' Education Chief Don James (right) chat with attendees at a Visitor Center reception.

Alexander Jefferson, addressed 1,200 students on Dec. 11 -12 in the main auditorium at Ames.

Jefferson is one of 32 African-American pilots shot down and locked in a World War II German prisoner-of-war camp. He discussed how that war changed the social, economic and psychological aspirations, hopes and accomplishments of black Americans.

"In the Air Force, I became one of 450 airmen, African American pilots, who trained in Tuskegee, Ala., and fought over North Africa, Sicily and Europe," he said.

One speech to students was 'webcast' world-wide via the Internet on Dec. 12. Webcasts enabled students to watch live video, listen to audio and interact in realtime on the Internet with experts. Links leading to the webcast are available on the Internet at: <http://quest.arc.nasa.gov/calendar/index.html>

"It was a warm, sunny day on the twelfth of August, 1944, when I, Lieutenant Jefferson, a member of the 332nd Fighter Group, climbed aboard my red-tailed P-51 Mustang and soared into the wild blue yonder to attack German radar stations along the coast of France," he said. "On one of my strafing passes, at 50 feet above the ground, I flew right into a hail of 20mm shells. There was a loud explosion, and immediately the cockpit filled with hot oil and smoke." Jefferson was able to fly to a higher altitude and parachute to the ground where he was captured.

More information about Jefferson is available on the Internet at: <http://quest.arc.nasa.gov/people/bios/aero/>



photos by Tom Trower

World War II 'Tuskegee Airman,' retired Air Force Lt. Col. Alexander Jefferson, addressed 1,200 students on Dec. 11 -12 in the Main Auditorium at Ames.

<http://tuskegeeair.com/>

As part of 'Aero Expo' events, students also toured some Ames facilities including: the Crew-Vehicle Systems Research Facility, the Vertical Motion Simulator, wind tunnels, the Air Space Operations Lab, the General Aviation Simulator and Hangar 1.

Greenfield Union, Monterey County; Live Oak, Santa Cruz; Berryessa, San José, Mt. Diablo Unified, Oak Grove, San José; Ravenswood, East Palo Alto; Hollister, Jefferson School District, Daly City; and Sunnyvale School District.

BY JOHN BLUCK

Cirrus cloud study may improve climate forecasts

Studies of cirrus clouds by some 150 scientists may lead to improved forecasts of future climate change.

Beginning next summer, scientists from NASA, other government agencies, academia and industry will investigate cirrus clouds in Florida with the objective of reducing uncertainties in forecasts of the Earth's future climate. The project focuses on studies of high, tropical cirrus clouds. These clouds are composed of tiny ice crystals that float at altitudes from 20,000 feet to 55,000 feet. Scientists will take measurements from a variety of aircraft and ground instruments for four to six weeks beginning in July. Analysis and reporting of the data are expected to take about two years.

"Our objective is to find out how ice clouds affect global warming," said Eric Jensen, project mission scientist based at Ames. "The combination of measurements and computer-modeling studies will improve our understanding of how cirrus may change in response to climate change. For example, as the surface heats up and thunderstorms become more intense, will larger, thicker cirrus clouds be formed?" he said.

"Clouds are the largest source of uncertainty in computerized global climate models," Jensen said. "We want to measure the ice crystal sizes, cloud optical depths and the heating or cooling of the Earth's surface caused by tropical cirrus clouds, particularly those generated by intense storms." Optical depth is a measure of the visual or optical thickness of a cloud.

The effort is called the Cirrus Regional Study of Tropical Anvils and Cirrus Layers - Florida Area Cirrus Experiment (CRYSTAL-FACE). Participants include researchers from various NASA centers including Ames; Goddard Space Flight Center, Greenbelt, Md.; Langley Research Center, Hampton, Va.; and Jet Propulsion Laboratory, Pasadena, Calif. Other participating researchers are from the National Oceanic and Atmospheric Administration, the National Center for Atmospheric Research, Boulder, Colo.; and various universities and companies. For a complete list of participants, please consult the project web site at: <http://cloud1.arc.nasa.gov/crystalface/>

"A major scientific goal is to use cloud measurements from aircraft to calibrate cloud readings from satellites so characteristics of clouds can be observed more accurately from the higher altitudes of orbiting spacecraft. Better-calibrated satellite observations of clouds will result in better large-scale measurements of clouds because satellites can see huge areas of the globe at once. These satellite cloud readings will enable scientists to make more accurate regional and global cirrus cloud computer models that should reduce the uncertainty of climate change predictions," Jensen said.

"We anticipate flights will mostly be over southern Florida, and occasionally we will

sample clouds over the ocean," Jensen said.

Six aircraft types will carry instruments to measure cirrus clouds. The high-flying ER-2 (similar to a U-2), based at NASA Dryden Flight Research Center, Edwards, Calif., will conduct remote sensing of cirrus clouds and environmental conditions. Scientists will compare the ER-2 instrument readings with similar satellite measurements.

The Proteus aircraft from NASA Goddard's Wallops Flight Facility, Wallops Island, Va., also will be making remote-sensing observations of cirrus clouds and environmental conditions.

The WB-57 aircraft based at NASA Johnson Space Center, Houston, will be making in situ measurements of cirrus clouds and environmental conditions. A Citation aircraft from the University of North Dakota will make in situ measurements in the lower parts of cirrus 'anvils.' An anvil is an extensive ice cloud that forms at the tops of deep thunderstorm clouds.

In addition, P-3 aircraft will use airborne radar to measure cloud structure and intensity. A Twin Otter airplane from the Center for Interdisciplinary Remotely Piloted Aircraft Studies, which is part of the Naval Postgraduate School and is based at the Navy

airport near Fort Ord, Calif., will make in situ measurements of aerosols and take other readings. Ground-based instruments in the study include radar and other instruments.

Satellites included in the study will be GOES, Terra, Tropical Rainfall Measuring Mission and the Aqua satellite currently scheduled for launch next year.

In addition to Jensen, other scientists from Ames will take part in the CRYSTAL-FACE project. They include Andrew Ackerman and Katja Drdla, Jensen's co-investigators who are working on cirrus cloud computer modeling. Peter Pilewski of Ames and his colleagues will use instruments on the ER-2 and Twin Otter aircraft to measure trapping of heat and reflection of sunlight by clouds. Max Loewenstein's experiment includes measurements of carbon monoxide and methane. Paul Bui and others from Ames are responsible for measurements from the WB-57 and ER-2 aircraft of temperature, pressure and winds. Henry Selkirk and Leonhard Pfister are studying development and movement of cirrus clouds. Selkirk and Pfister also are helping with meteorological support.

Project manager Michael Craig of the Ames Earth Science Project Office is in charge of the field campaign for NASA.

BY JOHN BLUCK ▲

Contractor excellence awards ceremony held

The Ames Contractor Council presented its twelfth annual Contractor Excellence Awards on Dec. 4 in the Moffett Training and Conference Center. These awards recognize



photo by Dominic Hart

Raytheon ITSS's HPCC/CAS Group receives a Team Excellence Award from Associate Center Director Nancy Bingham (far left) and council co-chair Dave Appling (far right).

distinguished employee contributions to Ames Research Center's mission and the Ames community. Associate Center Director Nancy Bingham joined council co-chair Dave Appling to make the presentations.

Twenty-one 'Individual Excellence Awards' and 16 'Team Excellence Awards' were earned this year, with the teams varying

in size from 3 to 28. Nominees had been recommended by their employer's site manager with the concurrence of the appropriate contracting officer's technical representative.

In light of the Sept. 11 tragedies, a special feature of this year's ceremony was recognition of all the contractor employees who do so much to keep our center safe and secure. These include protective services employees, DART and DUCT teams, and the Hazardous Waste/Emergency Response team. The council awarded 125 of these special certificates in recognition of those who keep us safe.

The council was established in 1987 as a contractor-government forum to address common problems and increase contractors' ability to respond to the center's changing needs. Its current officers are Deputy Center Director William Berry, co-chair; Dave Appling, Allied Aerospace, co-chair; Bob Javinsky (PAI), vice chair; and Lori Thompson, SIMCO Electronics, secretary. All resident contractors, subcontractors and grant administrators are encouraged to take part in the council's programs.

BY DAVE APPLING
CONTRACTOR CO-CHAIR ▲

'Restless Earth' may give earthquake warning

Signals that come from deep within the Earth eventually may give us a few days' warning before some large earthquakes, according to a scientist at Ames.

The source of these signals lies deep in the Earth's crust, where forces squeeze rocks to the limit before they rupture catastrophically, shaking the ground with destructive force, according to Ames' Friedemann Freund. He presented his discoveries and theory on Dec. 12, at the Moscone Center in San Francisco, during the 2001 American Geophysical Union (AGU) fall meeting.

"The challenge is to learn how to read and decipher the signals," Freund said. "The best way is to try to better understand the physics of the processes that underlie these signals. A step forward was the discovery of dormant electric charges in rocks in the Earth's crust," he said.

Earthquakes occur when tectonic plates, huge jigsaw-like sections of the Earth's outermost layers, rub against each other. Sometimes they collide head-on. In California, huge slabs of rock slide past each other, causing temblors along the San Andreas and other fault systems.

Freund has been investigating how rocks respond to stress. "If the stress level is high, electronic charges appear that momentarily turn the insulating rock into a semiconductor," he said. Semiconductors are materials that have a level of electrical conductivity between that of a metal and an insulator, and they are used to make transistors.

"These charges are not easy to pin down. They move with impressive speed, as fast as 300 meters (1,000 feet) per second," he said. By measuring the semiconductor properties of the rocks, Freund was able to show that the charges are positive. "Normally, these charges are dormant," he said. "But when rocks are squeezed, the charges wake up and flow out of the rock volume in which they were generated."

When charges flow, they constitute an electric current. When there is an electric current, there also is a magnetic field. If current varies with time, electromagnetic waves will be emitted.

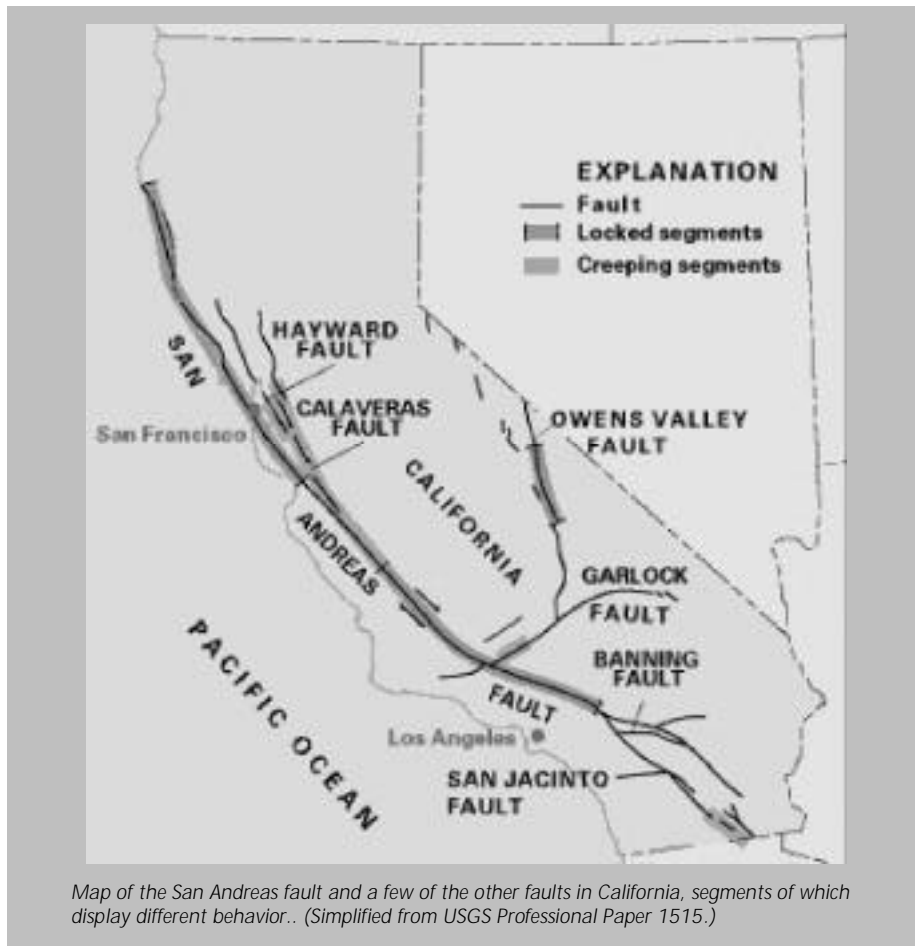
"The frequency of these electromagnetic waves will probably be very low, much lower than radio waves, but basically of the same nature," said Freund. "Scientists can pick them up at the Earth's surface with suitable antennae or by measuring the magnetic-field pulses that go with them."

"What happens when the charges reach the Earth's surface? They will change 'the ground,'" said Freund. "They should cause the Earth's surface to become positively charged over a region that may measure tens or even hundreds of kilometers. The Earth's ionosphere is bound to react," he said.

The ionosphere lies above the atmosphere, starting at about 90 km (56 miles) and extending to about 300 km (190 miles) into space. "When the surface of the Earth becomes positively charged, the charged plasma in the ionosphere must respond," said Dimitar Ouzounov, a scientist from NASA Goddard Space Flight Center, Greenbelt,

Md., who is working with Freund. The ionospheric plasma is very thin air that contains

"When the rocks in the Earth's crust crackle and buckle under the onslaught of tectonic



Map of the San Andreas fault and a few of the other faults in California, segments of which display different behavior.. (Simplified from USGS Professional Paper 1515.)

many free electrons and positive ions. In the lowest layers of the ionosphere, which reflect radio waves, the plasma is positively charged.

When the Earth's surface becomes positively charged, the plasma is pushed aside, and energetic electrons from the upper layers can penetrate more deeply into the lower part of the ionosphere. This in turn affects the transmission of radio waves, especially in the short wave region. In the days before the huge 1961 Chilean earthquake and before the nearly equally large Good Friday earthquake in Alaska in 1964 radio wave transmission effects were noticed.

"These ionospheric changes can also be studied from satellites. Russia, France and Japan are close to launching satellites dedicated to investigating these phenomena," Ouzounov said.

"But what has been lacking in the past was a physical explanation of how electric charges can be created in the Earth's crust," said Freund. "These are charges that move around, emit all kinds of signals and can even reach the Earth's surface. There they give rise locally to very high electric fields and change 'the ground' charge."

forces, the charges that are dormant in them are set free. They give rise to a dazzling array of phenomena, long known to mankind and even part of folklore in earthquake-prone regions around the globe," said Freund. "These phenomena range from anomalous electric and magnetic signals, to 'earthquake lights' that illuminate the mountain tops and strange animal behavior as well as ionospheric effects that impact how radio waves travel over long distances."

"It is both surprising and comforting that many seemingly disjointed or even inexplicable phenomena that point to impending earthquake activity seem to have just one cause--the awaking and spreading of normally dormant charges in the rocks deep in the Earth," Freund said.

"It is much too early and, in fact, unwise to expect that earthquakes would soon become predictable beyond the statistical probability that is currently the state-of-the-art," Freund said. "But one day, we'll learn to read the signals that the restless Earth emits before the rocks rupture with deadly force."

BY JOHN BLUCK

Ames launches redesigned Near Earth Object web site

On Dec. 7, Ames launched its newly redesigned Near Earth Object (NEO) web site. The site is home base for information about the comets and asteroids that are capable of colliding with our planet. The redesign (by Symtech) includes new images and an extensive database of potentially-threatening asteroids and comets, according to Dr. David Morrison, NASA's resident NEO expert and the site's driving force.

"It's a great resource and clearinghouse for NEO information aimed at the general public, interested professionals and the NEO research community," said Morrison, senior scientist at NASA's Astrobiology Institute (NAI). "A lot of people all over the world are interested in the potential risk of collisions with space rocks, especially after two big Hollywood movies were made on this subject." The site is accessible at: <http://impact.arc.nasa.gov>

The Ames NEO impact web site has been in operation since 1994, making it one of the pioneering web sites on the internet. The idea of a NEO web site was initially suggested to Morrison by Ken Bollinger, an employee of Symtech, who built and maintained the NASA impact site through its early years.

During the past eight years, millions of hits have been recorded, mostly from members of the general public who are interested or concerned about cosmic impacts.

The upgraded site includes a wealth of historical information about our growing awareness of the possibility of disastrous impacts, including the texts of Congressional testimony and of United States and British government reports on the impact hazard. The redesigned site also boasts a section on NASA's technically dazzling Near Earth Asteroid Rendezvous mission to asteroid Eros, which the spacecraft orbited starting in February 2000. NEAR ended its mission by landing on asteroid Eros on Feb. 12, 2001, sending back 69 close-up images during its final descent.

The site also contains links to information on the known NEOs and their orbits. Currently, NASA is about halfway through counting and logging the estimated 1,000 'big rocks' and has, by Congressional mandate, until 2008 to complete the task to the 90 percent level. This search is called the 'Spaceguard Survey.' The Spaceguard Survey focuses on the asteroids greater than 1 km in diameter, those large enough to cause devastating global damage. The concept of a threshold size for global disaster was first published in 1994 by Morrison. Much of the climate modeling that determined this threshold was also done at Ames by Drs. Kevin Zahnle, Brian Toon and their colleagues.

The Spaceguard Survey employs optical search telescopes that scan the skies around Earth up to about 100 million kilometers. With the support of Congress, NASA took the lead role in organizing and funding the

Spaceguard Survey, with the U.S. Air Force supplying equipment and key personnel.

The effort is spearheaded by the MIT-USAF LINEAR survey in New Mexico, supported by NEAT, a JPL/USAF partnership, Spacewatch, University of Arizona; LONEOS Lowell Observatory and the Catalina Survey, University of Arizona. Additional follow-up observations are mostly provided by dedicated amateur astronomers who volunteer their time to the effort.

The 'Spaceguard' name comes from science fiction novelist Arthur C. Clarke. In his novel 'Rendezvous with Rama,' Clarke discusses a NEO warning system built to protect the Earth following a disastrous comet impact in northern Italy on Sept. 11, 2008. Today, the scientific community hopes that such a warning system can be built without a disaster in order to provide a 'wake-up call.' Clarke, whom Morrison knows, supports the survey and is pleased to have contributed the name for this effort.

Morrison characterizes NEOs as statistical anomalies. "They are the most extreme known example of a natural risk with low probability but severe global consequences," he stated. "The probability of a global impact disaster in any one year is only about one in a million. It has been difficult to communicate the implications of these long odds to the media and the public," Morrison notes. "Hardly a day goes by without e-mail questions being received, many from people who have heard a little about the hazard and are concerned that an impact is about to take place or that the government might be covering up the danger," said Morrison. "Because of the public's interest, it is important for NASA to maintain an authoritative website where such questions can be answered in a responsible and non-threatening manner."

"While it is highly improbable that a large NEO will hit Earth in our lifetime, such an event is entirely possible," he warned. "In the absence of specific information, such a catastrophe is equally likely at any time, including next year," he said. "That is why it is important for the Spaceguard Survey to discover and track these asteroids. If there is an asteroid out there 'with our name on it,'

we want to have decades of advanced warning."



Artist's rendition of meteor that destroyed the dinosaurs, 'Dino Killer' by Don Davis. A large body of evidence supports the hypothesis that a major asteroid or comet impact occurred in the Caribbean region, probably causing the mass extinction of many floral and faunal species, including the large dinosaurs. This marked the end of the Cretaceous period. The impact site is thought to be in the northwestern Yucatan.

The Spaceguard Survey has been extremely successful, but Morrison warns of possible problems ahead. The flood of data from the search telescopes may be too much to process by an understaffed community of loosely-knit observing agencies. Also, as Spaceguard ticks off and categorizes NEOs larger than 1 km, it will likely shift its focus and search for bodies less than a kilometer in diameter, vastly increasing the numbers found. Morrison notes that "observing efforts are widely international and depend on volunteer labor. As the number and size of survey telescopes increases in the decades ahead and the NEO observations take on smaller objects, the follow-up will become increasingly difficult." The answer may lie in increased international funding. Japan is constructing a new survey telescope and the UK government has recommended construction of a larger 3-meter telescope. The U.S. National Research Council recommended this year the construction of an 8-meter survey telescope to be used in part for discovery of NEOs down to 300 meters in diameter.

Morrison chaired the original, Congress-mandated NASA study of the NEO impact hazard in 1992, a seminal effort which gave rise to NASA's sky survey. He currently chairs the International Astronomical Union working group on NEOs. He wryly notes that his 'hobby' is defending Earth from impacts, and this has been his most successful effort, with not one person killed by a space rock in the decade he has been on the job.

BY KATHLEEN BURTON

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: Samson Cheung at ext. 4-2875 or Lich Tran at ext. 4-5997.

Ames Bowling League, starts Sept 4. 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 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 website for meeting dates: <http://acc.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, Dec. 19, 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, Dec 20, 12 noon, N-T28 (across from N-255). POC: Michael Wright, KG6Bfk, at ext. 4-6262. URL: <http://hamradio.arc.nasa.gov>

Environmental, Health and Safety Information Forum, resumes Thursday, Feb 7, 8:30 a.m. to 9:30 a.m., Bldg. 19/Rm 1040. URL: <http://q.arc.nasa.gov/qe/events/EHSeries/> POC: Julie Quanz at ext. 4-6810.

Nat'l Association of Retired Federal Employees (NARFE), Jan. 4, S. J. Chptr #50 mtg, 9:30 a.m., Hometown Buffet, Westgate Mall, 4735 Hamilton Avenue., San José. Program at 10 a.m. Eldercare specialist. Lunch at 11 a.m. \$6.27 pp. POC: Earl Keener (408) 241-4459 or NARFE 1-800-627-3394.

Ames Contractor Council Mtg, Jan. 9, 11 a.m., N-200, Comm. Rm. POC: Paul Chaplin at ext. 4-3262.

Native American Advisory Committee Mtg, Jan. 22, 12 noon to 1 p.m., Building 19, Rm 1096. POC: Mike Liu at ext. 4-1132.

Ames Classifieds

Ads for the next issue should be sent to 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

Looking for 3bdm house for rent w/yard in Mtn. View/Sunnyvale area, perhaps with rent/lease-to-own option. Can pay up to \$1,600/mo. Contact: falcon777@earthlink.net

Duplex for rent, Santa Clara location, 1bd/1ba, 2 car garage, FP, backyard w/BBO, sm. pet allowed, 10 mls. from Ames, \$1,100/mo plus utils. Connie or Joe (408) 246-5295.

Shared housing with youthful grandmother in South San José (Capital Exp/Snell). \$850 rent (util inc.). 3 bd/2.5 bath condo, fireplace, W/D, large yard/deck, garage parking. Pool/jacuzzi in complex. Call (408) 227-5503.

Studio apt for rent, month-to-month lease. One mile from Moffett. No pets. \$850. Call (650) 965-0775.

Looking for roommate, mature female in mid 20s. Spacious mstr bd/ba available in 2bd/2ba apt in Mtn. View. \$800/mo.+ 1/2 util+sec dep (\$750). Renovated interior with D/W and refrig. Slightly furnished. 1 shared, cov'd parking space. Laundry facilities in complex. No pets. Sep. phone line. 5 mins to Ames. Call (650) 237-9160.

Mtn. Vw townhouse, 1st time rental, 3 bd/1.5 ba, yard, quiet complex with pool, near Stevens Creek trail, 3 minutes from Ames. \$1,800/mo. Call (650) 967-7659.

Looking for host family: A Japanese 20 yo college student is planning to visit Bay Area in mid-Feb. Wants to stay with a host family to practice English. If interested in hosting him for a week, please call (650) 237-9160.

Large room for rent w/separate closet, bay window, and shared bthrm in 100-year-old Victorian house (renovated in 1996). 15 mins from Moffett. 2 other roommates, shared utils. Rent \$550/mo. Landlord pays water and garbage. No pets. Call (408) 942-1502 (H), (408) 481-2064 (W) or (408) 932-1221 (pager).

Room in 3bd/2ba Mtn. View townhouse. \$800 rent (incl. utils). Share w/prof'l female and cat. Private bathroom. Female preferred. NS/NP. Call (650) 254-1121.

Pleasant furnished bdrm for rent in home in San José for considerate prof'l. Off-street parking, family nbrhd.. Close to shopping and major highways. Long term preferred, shorter term possible. Shared bath/kitchen. Bdrm with bath also available. Lease/deposits required. Call (408) 266-7272 and lv. msg.

Miscellaneous

HP Desktop 8655C, CD-RW/CD-Rom, 192 MB RAM, 20G HD, purchased 4/2000 for \$1,000. Asking \$350 or B/O. Call (650) 493-1079.

Two matching pairs of double, prairie-style casement windows removed from 1923 California Bungalow home. Good condition. Call for photos. \$75. Call (408) 295-2160.

Hot Springs portable spa, 5 person. Good condition; newer cover; rebuilt pump; 14 yrs old; you pick up, \$500 or B/O. Jim (408) 255-2301.

Canon BJC-6000 photo printer (1440x720dpi) with manual & software with (6) full ink tanks and spare black cartridge. 1 yr old in great condition: example photos available, \$75. Call (408) 295-2160.

Black entertainment center from IKEA. Will fit TV with maximum width of 32 in. Measure 60"x48.5"x20." Side storage for CD/DVD/video. \$180. E-mail for pictures at: wusan@hotmail.com. Sandy (408) 578-0590.

Two round-trip airplane tickets to anywhere in the CONUS on any date. Asking \$250 or B/O. Pay for them after you are confirmed on the flight. Call Sarah (650) 537-0057.

Offering one week at our timeshare, the Suites at Fisherman's Wharf, for 300 dollars. Call Sarah Kent (650) 537-0057.

Transportation

'70 VW convertible classic, original owner, no smog needed: transmission ok; needs work on top & possibly engine. \$1,600. Esther or Art (650) 961-2732.

'85 Mitsubishi Pickup, 108,000 miles, 4WD, PS, 5-speed, straight body, good interior, matching shell, Sony cassette, shop manual, original owner. \$1,900 or B/O. Call (408) 945-3917.

'88 Toyota Tercel, burgundy/grey, 98K mls., 5 spd, good condition. Great for grads! \$1,500 or B/O. Call (925) 699-3482.

'88 Toyota Tercel EZ Liftback 2D white, 4-speed manual, 160k mls, runs smoothly, \$1,200. Call (415) 219-3239.

'89 buick century limited, auto, air, loaded. four new tires, like new, smoged, \$2,675 or B/O. Call (408) 733-1906.

'93 BMW 850 Ci V12, \$27,000. Approx 82K mls, new tires, dual side-by-side A/C, dual 8-way pwr htd lthr seats, ster cass/6 CD chgr, crus. cntrl, snrf, elect kyless access, automatic/manual sport mode' trans, fast, great hnding. Call (408) 285-9616.

'97 Ford Ranger XLT, std cab, SB, desert tan, 4 cyl, 2.3 ltr, A/C, pwr steering, sliding rear window, Vista camper shell, bedliner, AM/FM stereo cassette, full size spare, 69K mls, \$6,300 or B/O. Bob or Maureen (925) 600-8723.

'98 Ford Ranger XLT, ext cab, automatic, V6 3.0, AC, Vista camper shell, carpet kit, AM/FM stereo, cassette, 25K mls, \$12,000. Deanna (408) 260-1180 between 5-9 p.m.

'99 Chevrolet Suburban LT 2500 ton, \$32,000, 454 cu V8, elect. actuated 4X4 & limited slip posi, 'all power,' ABS, 32K mls, new tires, dual A/C (front/rear), dual 8-way pwr htd seats (front), 8 passgr lthr seating, ster cass/CD, crus cntrl, tow pkg, security sys, balance of new vehicle warranty, (6 mos to 36,000 mls). Call (408) 285-9616.

Car Pool

Monterey/Salinas to Ames. 5 days per week, 7 a.m. to 4 p.m. workday, responsible people. Bob at ext. 4-2523 or Morrow at ext. 4-0379.

U.C./Fremont/Newark Carpool: Existing 3 person carpool would like to add fourth. Leave park & ride lot at Ardenwood and 84 at 6 a.m.; leave Ames at 4 p.m. Flexible driving arrangements. Mark at ext. 4-0102 or email mfulton@mail.arc.nasa.gov.

Need new ride to and from work, starting on Jan 4, 2002, from San Mateo to Moffett Field. Hours are flexible. I do not drive, I pay for gas, \$10 a day, it would be \$50 dollars a week. If willing to help, call Maria, ext. 4-4394.

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. Check out our special holiday sale event. 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.

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. Wkend \$500, midwk \$190 nite. Included lines, cleaning, propane fireplace, fully furnished. Call (650) 968-4155. 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, fireplace, charcoal BBQ, priv. boat dock, great lake view. Sleeps 8. \$1,050/wk. Call (559) 642-3600 or (650) 390-9668.

Big Sure 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 bdrms/2 ba, sleeps 8. Fireplace, TV/VCR, MW, W/D, jacuzzi, sauna, pool. Available for family reunions, corporate retreats, weekend getaways, ski vacations. \$120/night low season; \$155/night high season. \$240/night New Years. \$90 cleaning fee and 12% Nevada room tax. Charlie (650) 366-1873.

WebTADS - it's about time!

The archaic era of tangible timesheets will soon disappear at Ames. Beginning in late Spring 2002, Ames employees will participate in the initial e-government effort brought to the center by the Integrated Financial Management Program (IFMP). All civil service employees will transition to a web-based entry system called WebTADS (Web-based Time and Attendance Distribution System), which combines increased flexibility and ease-of-use for the end user. Once rolled out, WebTADS will allow employees to input timecards via the web, anytime . . . anywhere.

WebTADS is user friendly and simple to operate. The application, a product of Marshall Space and Flight Center (MSFC) with assistance from Fulcrum Software, can be accessed via the Internet using Netscape 4.7 or later or Internet Explorer 5.0 or later. Employees need only their user name and password to access the system and enter time and attendance information. WebTADS will import data from the NASA Personnel and Payroll System (NPPS) each pay period.

Ames employees will enjoy a number of enhancements with the rollout of this new on-line time and attendance system:

- Timekeeping can be submitted from anywhere 24 hours a day;
- WebTADS is paperless;
- WebTADS displays leave balances on-line; and
- WebTADS allows for a later time card submission date.

Training will be offered which will cover both hands-on experience as well as policy issues. During the months of December and

January, more in-depth information regarding WebTADS will be provided to the center.

For more information, contact the WebTADS POC Amber Sutton, at ext. 4-3689.

Featured library user

Want to know more about the projects of Dr. John Greenleaf, principal investigator and the facility scientist for the human-powered centrifuge? Stop by the Technical Library, building N-202, bulletin board.

Read all about his accomplishments and current research. Get copies of his current paper: "Effect of Exercise Training and the +Gz Acceleration Training on Men."

Astrogram deadlines

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

<i>Deadline:</i>	<i>Publication:</i>
Fri, Jan. 11	Mon, Jan. 22
Fri, Jan 25	Mon, Feb. 4
Fri, Feb 8	Mon, Feb. 18

Airborne observatory exhibit opens at Ames

continued from page 6

tions in the telescope, which reduces its image quality. Exhibit visitors will be able to see the movement of the telescope's aperture and the opening and closing of the telescope's door by pushing a button.

NASA awarded a \$484.2 million contract to Universities Space Research Association, Columbia, Md., in December 1996, to acquire, develop and operate SOFIA. Other team members include Raytheon Aircraft Integration Systems, Waco, Texas; United Airlines, San Francisco; the University of California, Los Angeles, Berkeley and Santa Cruz, Calif.; the Astronomical Society of the Pacific, San Francisco; and the SETI Institute, Mountain View, Calif. SOFIA's complex telescope is being developed by DLR, the German Aerospace Center, located in Bonn, Germany.

Annual operating costs of SOFIA are anticipated to be about \$40 million. SOFIA's first test flight is currently scheduled in October 2003 at Raytheon's Waco, flight facility. SOFIA is scheduled to arrive at Ames in May 2004 for final testing preparatory to full-scale operations starting in late 2004. Further information about SOFIA is available on the SOFIA web site located at: <http://sofia.arc.nasa.gov>

BY MICHAEL MEWHINNEY 



National Aeronautics and Space Administration

Ames Research Center
Moffett Field, CA 94035-1000

Official Business
Penalty for Private Use



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



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

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

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



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