

The Ames Astrogram

Communication for the Information Technology Age

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NASA recognized for management reform progress

On July 15, the White House Office of Management and Budget (OMB) -- the Executive Office of the President -- made an announcement that many in NASA's senior leadership team had been waiting to hear. NASA is on the right track to restoring public confidence.

In its 'Mid-Session Report,' OMB named NASA as the federal agency that has demonstrated the most progress in implementing the reforms championed by President George Bush, a set of initiatives known as the President's Management Agenda.

The Agenda calls for a government that is "active but limited," that rethinks and then reforms itself to become "citizen-centered, results-oriented and market-based." The Agenda identifies five government-wide initiatives designed "to improve federal management and deliver results that matter to the American people." The five initiatives are strategic management of human capital; competitive sourcing; improved financial performance; expanded electronic government and budget and performance integration.

According to the OMB report, as of July 15, "NASA is leading the government in its implementation of the five government-wide initiatives." This is in stark contrast to OMB's assessment of NASA's status back in January 2001, or even its current rating of the Agency's

status. But as OMB made clear, NASA is making progress. The Agency is moving in the right direction on all fronts.

NASA Administrator O'Keefe acknowledged such during a recent all-hands meeting with Ames employees. Everyone at NASA should be encouraged by the progress we have made, he said, and especially by the fact that "somebody noticed." However, what we have achieved so far is "the easy part," he said. Now, we have to do what we said we would do; now we have to actually implement our reform plans. Still, he emphasized, it is important that NASA's efforts to improve itself have been observed and recognized.

According to the recently issued OMB 'Executive Branch Management Scorecard,' NASA is the only federal agency to receive successful marks (shown as green 'traffic lights') across the board in its progress in implementing the President's Management Agenda. While gratified, O'Keefe cautioned, "that's an achievement that we are at once very proud of but, at the same time, should consider to be the absolute bare minimum of what it is we need to do in order to achieve . . . credibility and to restore public confidence."

The assessment of NASA in the recent OMB document states that "NASA has made notable progress in each area of the man-

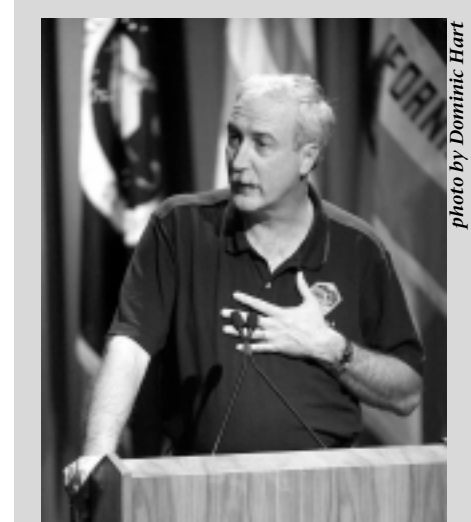


photo by Dominic Hart

Administrator O'Keefe takes a question from the audience at the recent Ames all-hands meeting.

agement agenda." Specifically, "NASA has developed its first strategic human capital plan; completed a pilot of its first agency-wide human resources tracking system; increased the number of positions that could be open to competition by 70 percent over its 2000 FAIR Act inventory; and developed an interim plan for competing up to 40 percent of the commercial positions on its 2000 inventory."

Further, "while NASA's financial performance 'status' deteriorated because of a disclaimer of opinion on its 2001 audit after a change of auditors, since then NASA has worked with its new auditor to develop an action plan and expects resolution of all outstanding issues by the end of July. In terms of E-government, NASA has strengthened the role of its Chief Information Officer, and is improving its capital planning and investment control process and IT security tracking. Finally, NASA has aligned its budget structure with program outputs and prepared for full cost and performance budgeting in 2004," the report said.

The fact that no federal agency performed well on the first evaluation and that the initial scorecards show a lot of poor scores was to be expected, according to the January 2001 report. When the Management Agenda items were selected, the areas were "targeted to

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See related 'Freedom to Manage' story, p.2.

Air Expo draws crowds to Moffett



photo by Jon-Pierre Wiens

An estimated 60,000 visitors attended the Air Expo on July 27-28. Visitors got a chance to view NASA's current research in information technology, aeronautics and space sciences showcased in the 'Tech Space' Pavilion inside Hangar 1. Outside, spectators watched the various aircraft perform aerobatic maneuvers.

... see more Air Expo photos on page 14

EPA recognizes Ames' recycling, pest management efforts

Goats munching 'stubborn' vegetation and workers composting landscaping debris and reducing pesticide and herbicide use have resulted in an Environmental Protection Agency (EPA) award for Ames.

In 2001, Ames cut pesticide and fertilizer use by 98 percent compared with previous years. The center also recycled all of its landscaping debris by composting, saving an estimated \$60,000 in disposal costs. As a result of this demonstrated commitment to the environment, Ames recently received the EPA's 2002 Environmental Achievement award.

"I am pleased that the EPA has recognized our team's outstanding work," said Steve Frankel, Ames' manager responsible for facilities maintenance, including landscaping. "We worked cooperatively with Ames' environmental division, contractors and subcon-

tractors alike to ensure the success of the program. It's been a true team success story."

"Minimal use of pesticides, herbicides and chemical fertilizers has resulted in dramatically reduced exposures to workers applying these products, as well as likely reductions in exposures to other employees who might have come into contact with such materials," said Diane Shelander of the Environmental Services Division at Ames. "We are proud of what we have achieved in fully meeting center needs while protecting our entire workforce."

To minimize its solid waste disposal, Ames began making its own compost. The center produced about 2,200 cubic yards of compost in 2001. More than one-third of Ames' solid waste--landscaping debris that would have gone into land disposal--was instead reused.

In 1997, the center applied 4,000 gallons of pesticides and herbicides, but in 2001, it used less than 50 gallons. To achieve this reduction, workers utilized traps to catch pests and eliminated large-scale pesticide applications.

Ames now has reduced the overall volume of herbicide use, applies herbicides that are less toxic, and maintains drought-resistant, native vegetation. A group of 13 goats patrols certain areas to control 'hard-to-deal-with' vegetation.

"Goats are goats--they eat just about anything," said Jon Talbot, project manager for South Bay Maintenance, a contractor for the NASA Ames Plant Engineering Branch. "They eat thistles, cattails and all kinds of grass." An adult goat eats about two to three pounds of vegetation per day, according to Talbot.

BY JOHN BLUCK ▲

NASA's 'Freedom to Manage' is on fast track at Ames

Anyone who has worked for or with the federal government for any length of time undoubtedly has said in frustration, "Why does it take so long to get this done? I could do this in a fraction of the time and at half the cost!"

If you have ever had a better idea about a more efficient way of doing business with or for NASA, here's your opportunity to really make a difference. Through the new Ames Freedom to Manage (AF2M) initiative, everyone who works at Ames--civil servants, contractors and student employees--now has the opportunity to help remove or reduce those bureaucratic stumbling blocks. The result--a better, more efficient and productive place to work.

"The government sometimes impedes the way we do business because of obstacles imposed by policies and procedures," said Lynda Haines, chair of the AF2M task team. "With AF2M, we are asking the Ames staff to challenge the obstacles they encounter so they can work more efficiently and effectively."

A principal goal of the Bush administration is to remove barriers to more efficient management, with expectations of improved accountability and performance, as stated in the President's Management Agenda. NASA Administrator Sean O'Keefe wrote in a letter to officials at Headquarters and NASA field centers, "This so-called Freedom to Manage initiative is central to the President's commitment to deliver higher performance throughout government. ... Being creative and finding new ways to set aside bureaucratic obstacles for managers is the heart of the President's Freedom to Manage effort."

The AF2M task team held its first meeting on July 25. Its purpose is "to identify and stimulate change to impediments to effective management both in the agency and at Ames Research Center." The team will consider a wide range of items, from externally imposed legislation or regulations, to NASA-imposed policies, Ames-imposed policies and practices, and non-existent authority that if implemented would enable a more efficient approach. The impediments that are beyond the scope of Ames will be forwarded to

the agency Freedom to Manage team.

The task team needs the help of the Ames workforce to identify impediments to efficient, effective government. Each directorate and several functional areas have representatives on the team, who will serve as focal points to identify feasible ideas warranting agency or Ames attention. The team will review each impediment identified, evaluate the feasibility of correcting the item, set priorities for items to be addressed, approve proposed solutions, and provide necessary support for functional areas to act to effect change on items wholly within their purview.

Members of the Ames Freedom to Manage task team are:

Lynda Haines, chair
Debbie Wood, deputy chair
Rho Christensen, executive secretary
Phil Snyder (Code A)
Ron Johnson (Code D)
Debbie Wood (Code F)
Dennis Koga (Code I)
Katie Garcia (Code J)
Laura Doty (Code Q)
Bernie Luna (Code S)
Dave Appling (Contractor Council)
Thomas Ho (Human Resources, Code JH)
Gene Moses (Procurement, Code JA)
Ron Liang (Financial Management, Code C)
Ann Hutchison (Public Affairs, Code DX)
Sally Mauldin (Legal, Code DL)

The task team is setting up a Web site that should be operational by the end of August. Through this site, you will be able to get up-to-date information about the progress of the task team, check the status of suggested improvements, and submit a suggestion.

The NASA Administrator, Ames Director Dr. Henry McDonald and NASA Chief of Staff and Whitehouse liaison Courtney Stadd are committed to making the F2M concept a success. Task team members are setting aside several hours a week to make Ames a better place to work, but they need the help of every civil servant, contractor and student intern. They need YOU to think about the impediments that keep you from doing your

job most efficiently and effectively or that simply cause unnecessary frustration.

Administrator O'Keefe has talked about some of the things the NASA Headquarters' F2M task force has accomplished, such as eliminating restrictions on travel, implementing the One-NASA badge, streamlining time-and-attendance record-keeping, and delegating reorganization authority to the centers.

Now it's our turn to make NASA and Ames a better place to work.

BY ANN HUTCHISON ▲

NASA recognized for management reform progress

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address the most apparent deficiencies where the opportunity to improve performance is the greatest," according to the President. As the report went on to say, "the marks that really matter will be those that record improvement, or lack of it, from these starting points."

And that is what makes the recent OMB update so important. While everyone recognizes that NASA still has a long way to go, the Agency has made a good beginning and the effort clearly isn't going unnoticed in the President's executive management circles.

Other federal agencies that were recognized for significant progress in implementing presidential management reforms include the departments of Commerce, Education, Energy, and Labor, the Treasury, the Office of Personnel Management, and the Small Business Administration. The Agriculture and Transportation departments and the Corps of Engineers were noted for failure to make much if any progress.

Additional information about the Mid-Session Review, including the first-ever evaluation of 'Progress Implementing the President's Management Agenda' and the 'Executive Branch Management Scorecard' can be found at <http://www.whitehouse.gov/omb/budget/fy2003/msr.html>

BY DAVID MORSE ▲

NASA Honor awards acknowledge Ames' key contributors

The 2002 NASA Honor Awards ceremony for Ames Research Center was held on July 10 in the main auditorium. Ames presented NASA honor awards to the 25 employees who were selected for individual awards and

to the managers of the eight groups that were selected for the NASA Group Achievement Award. The names of the individual honorees and the groups and members are listed below.

Outstanding Leadership Medal

Maurice M. Averner
Baruch S. Blumberg
David J. Hollenbach
G. Scott Hubbard
Robert A. Jacobsen
David B. King
Michael L. Marlaire
Parviz Moin
Tina L. Panontin

Public Service Group Achievement Award

PAI Corporation VPP Team

Equal Employment Opportunity Medal

Jolen Flores

Public Service Medal

Kathleen M. Connell
Kanna Rajan
Donald W. Richardson

Group Achievement Award

Ames Astrochemistry Laboratory Group
Aviation Safety Reporting System (ASRS) Team
Future Flight Central Team
Computing, Information and Communications Technologies (CICT) Program Team
1024 Processor Single System Image Origin 3000 Supercomputer Project Team
Voluntary Protection Program (VPP) Leadership Team
Fourth Convection and Moisture Experiment (CAMEX 4) Science Team

Exceptional Scientific Achievement Medal

Andrzej Pohorille

Exceptional Achievement Medal

Daniel E. Cooke
Dallas G. Denery
Charles W. Duff
Leroy S. Fletcher
Ronald J. Liang
George W. Sutton
Steven S. Wegener
Gregory G. Zilliac

Exceptional Service Medal

Paul R. Agnew
Karen L. Gundy-Burlet
Donna Z. Lacy
Harry N. Swenson



Kanna Rajan, after receiving the Public Service Medal at Ames on July 10.



NASA 2002 honor award recipients seen here during the award ceremony at Ames on July 10.

PDM goes live

Position Description Management (PDM) is scheduled to 'Go Live' on Aug. 19 at Ames. PDM is a pathfinder project for the Integrated Financial Management (IFM) Program Office. PDM supports the 'One NASA' concept that the agency is creating, in part, with IFM. PDM provides a state-of-the-art tool used to standardize the way we do position classification. The benefits of PDM include:

- automates the current process;
- enables the creation of new position descriptions easily and speedily;
- encourages and maintains supervisory and HR collaboration;
- streamlines classification; and
- customizes Ames PDs with NASA-specific job information.

NASA Headquarters, Goddard Space Flight Center, Langley Research Center, Stennis Space Center and Glenn Research Center have successfully implemented PDM and are now 'live.' Ames' 'roll-out' will take place during the week of Aug. 12 through the 16. All supervisors who have not yet done so are strongly encouraged to sign up early for training. The training is conducted by Avue Digital Services trainers.

The training schedule for supervisors is:
Dates: Tues., 8/13 or Wed., 8/14
Place: Bldg. 241, Rooms 147 and 149
Times: 8:00 a.m. to 10:00 a.m.; or
10:00 a.m. to 12:00 p.m.; or
1:00 p.m. to 3:00 p.m.

Contact Barbara Chenier to sign up for a training session. She can be reached at bchenier@mail.arc.nasa.gov

Center Briefs

Black holes in distant galaxies point to wild youth

Like 'flower power' tattoos on aging hippy baby boomers, unexpectedly large numbers of neutron stars and black holes in elliptical galaxies suggest some of these galaxies lived through a much wilder youth. The discovery by NASA's Chandra X-ray Observatory may require a revision of theories of how elliptical galaxies evolved.

"For the first time, Chandra has allowed us to distinguish hundreds of star-like sources that are black holes and neutron stars in distant elliptical galaxies," said Craig Sarazin of the University of Virginia, Charlottesville, who presented his team's findings on three elliptical galaxies, known as NGC 4697, NGC 4649 and NGC 1553, in June at the American Astronomical Society meeting in Albuquerque, N.M. "The black holes and neutron stars we now see in these elliptical galaxies are reminders of their very active past.

NASA selects two small explorer missions

Spacecraft that will observe the Earth's highest clouds and detect hidden matter in the universe have been chosen as the next two missions in NASA's Small Explorer (SMEX) program.

"From the time Explorer 1 was launched more than 40 years ago and discovered the Van Allen radiation belts, Explorer satellites have made impressive discoveries by obtaining significant science at the lowest cost," said Edward Weiler, Associate Administrator for Space Science, NASA Headquarters, Washington. "The two missions we've selected will continue in the Explorer tradition by investigating some of the most fundamental questions raised in space science."

'Interplanetary Superhighway' makes space travel simpler

A 'freeway' through the solar system resembling a vast array of virtual winding tunnels and conduits around the Sun and planets, as envisioned by an engineer at NASA's Jet Propulsion Laboratory (JPL), Pasadena, Calif., can slash the amount of fuel needed for future space missions.

Called the Interplanetary Superhighway, the system was conceived by Martin Lo, whose software was used to help design the flight path for NASA's Genesis mission, which is currently using this 'freeway in space' on its mission to collect solar wind particles for return to Earth.

Most missions are designed to take advantage of the way gravity pulls on a spacecraft when it swings by a body such as a planet or moon. Lo's concept takes advantage of another factor, the sun's pull on the planets or a planet's pull on its nearby moons. Forces from many directions nearly cancel each other out, leaving paths through the gravity fields in which spacecraft can travel.

NASA study examines athletes' bones

To most of us, a bone is a 'dead' thing. But to scientists and physicians, bones are alive, active and adapt to the environment to support the loads imposed on them. Less loading is usually reflected in less bone density.

Prolonged bed rest provides the best way to create many of the physiological effects of long-duration space flight, including bone loss. But bed-rest simulations are limited to only a few months, nowhere near the length of time required for a trip to Mars, for example. So scientists recently turned to synchronized swimmers and the buoyant environment of water to answer questions about the capability of the skeleton to adapt to the load it is exposed to. Would the bones of swimmers respond to buoyancy the same way as the bones of astronauts respond to microgravity during space flight?

The skeletons of swimmers also may well resemble those of astronauts who have been in space for long periods of time, said Dr. Sara Arnaud, of Ames' Life Sciences Division. The movements of astronauts during space flight often resemble those of synchronized swimmers, who turn, propel and lift their bodies from below the water, using various arm and leg movements. Scientists expected to find less bone mineral in weight-bearing bones and more in the upper extremities of both the astronauts and swimmers.

To confirm their hypothesis, Arnaud and principal investigator Michael Liang, Ph.D., an exercise physiologist from California State Polytechnic University in Pomona, recently recruited world-class athletes from two local synchronized swim teams, Stanford University and Santa Clara Aquamaids, for their study. They measured bone mineral density in the heel and wrist, as well as strength of the long bones in the upper and lower extremities. Graduate students Alex Moreno of Cal Poly and Patrick Hatch of Ames also assisted with the study.

"Theoretically, world-class athletes exposed to a buoyant environment for many years would have skeletons adapted for that environment," Arnaud explained. Low-impact training and 'loading' should be reflected in differing bone and muscle strength between the swimmers and a comparison group who exercised on the ground rather than in water. The comparison group were volunteers from the women's gymnastics team at Stanford.

The scientists used a small commercial densitometer to determine the differences in bone mineral density of the heel and wrist. They used an instrument developed by Ames' Dr. Don Young and Stanford University's Dr. Charles Steele to measure non-invasively the stiffness of long bones – the ulnas (lower arm bones) and tibias (lower leg bones). The instrument, called the mechanical response tissue analyzer (MRTA), delivers a very brief (2- to 3-second) low-frequency vibratory stimulus to the skin surface from an electromagnetic 'shaker.' A mathematical model then is used to determine the lateral bending stiffness of the entire bone. Scientists have used the MRTA in previous studies at Stanford

University and at Ames to evaluate the biomechanics of the ulna and the tibia, long bones with the least amount of soft tissue overlaying the center of the bone.

The investigators expected the density of the heel in swimmers to be lower than normal. Actually, they found it was very much the same as in normal, non-exercising individuals, but lower than in the gymnasts who expose both their heels and wrists daily to high gravitational loads and were expected to have high bone density.

"Of most interest were the preliminary data that showed more nearly equal mineral density in the heels and wrists of both athlete groups than in a normal reference population," Arnaud noted. "Our data from the athletes will be applied to the development of training programs for the astronaut with a view to preventing bone loss in weight-bearing bones during prolonged space flights."

BY ANN HUTCHISON 

Computer history lecture set

The Computer History Museum is hosting a lecture on 'Half a Century of Disk Drives and Philosophy from IBM to Seagate' presented by Al Shurgart. He will share stories of the unconventional leadership style that made him a legend in the disk drive industry.

The lecture will be held on Thursday, Sept. 5, at 7 p.m., at PARC, Pake Auditorium, located at 3333 Coyote Hill Road, Palo Alto. A member and VIP reception is scheduled for 6:00 p.m.

Another lecture to be hosted by the Computer History Museum and HP will be given by Mitch Waldrop, author of 'The Dream Machine: The Revolution that Made Computing Personal.'

This event will be held on Thursday, Sept. 19. A member and VIP reception is scheduled for 6:00 p.m. The lecture will start at 7:00 p.m. It will be at Hewlett-Packard, building 20, located at 3000 Hanover Street, Palo Alto.

Mitch Waldrop brings us the fascinating story of JCR Licklider and 'The Revolution that Made Computing Personal.' Licklider may well have been one of the most influential--and least known--people in the history of computer science. As a division director in the Pentagon's Advanced Research Projects Agency (ARPA) in the early 1960s, Licklider put in place the funding priorities that would lead to the Internet and the invention of the 'mouse,' 'windows' and 'hypertext.'

The event is free. Advance reservations are required. Visit our Web site at: <http://www.computerhistory.org/> or call 650 604 0345 for more information.

NASA UAV center to train students about aerial missions

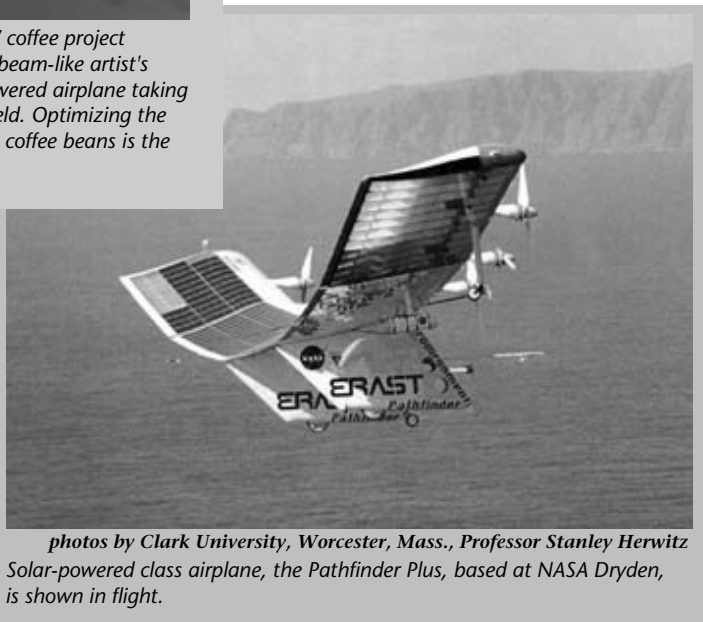
NASA and Clark University are developing a system to train students to plan and conduct missions by remotely controlled air-

craft capable of taking aerial images of natural disasters, crops and even of Mars and other planets.



Freeze frame from UAV coffee project Internet movie, shows beam-like artist's conception of solar-powered airplane taking images over a coffee field. Optimizing the harvest of higher value coffee beans is the goal of the project.

firefighters, disaster relief workers and farmers. "The primary thrusts of this new educational program are to train people who can develop UAV technology, plan missions, conduct them and accurately and quickly interpret the real-time digital images acquired," said Dr. Stanley Herwitz, professor of Earth science at Clark University, Worcester, Mass. Herwitz serves as a UAV principal investigator and leads a team of more than 20 researchers at Ames. "New technology is now being developed that will produce an astonishing number of aerial images taken from UAVs capable of long-duration flight."



photos by Clark University, Worcester, Mass., Professor Stanley Herwitz
Solar-powered class airplane, the Pathfinder Plus, based at NASA Dryden, is shown in flight.

craft capable of taking aerial images of natural disasters, crops and even of Mars and other planets.

NASA anticipates that as the use of remotely piloted, uncrewed aerial vehicles (UAVs) expands, specialists must be trained to support aerial missions expected to generate large numbers of pictures taken with on-board, high-resolution digital imaging systems. Future missions may include imaging flights that would help

Specific activities will include planning future UAV image acquisition campaigns; developing procedures for operating UAVs

in Federal Aviation Administration-controlled airspace; testing and evaluating high-resolution imaging systems; testing real-time telemetry systems for payload control and data transfer; evaluating data acquisition and control systems for real-time applications; developing and packaging automated image processing streams; integrating imaging payloads onto UAVs; and implementing educational research opportunities for university students.

"More trained people are needed to evaluate aerial images so they will be available on a timely basis," Herwitz said. "These pictures will have to be studied by specialists to be useful during disasters, at harvest time and in other time-critical situations."

An Ames-based research team led by Herwitz is conducting the \$3.76 million project for NASA's UAV science demonstration program. The effort will provide the first-ever commercial demonstration test of a solar-powered UAV operating in national airspace this fall over the largest coffee plantation in the United States. In addition, Herwitz spearheaded the formation of a center at NASA Research Park adjacent to Ames to conduct collaborative UAV research and development as well as educate students.

During a ceremony in May at Ames, officials from Ames, NASA Dryden Flight Research Center, Edwards, Calif., Clark University and the Girvan Institute, a non-profit organization located in NASA Research Park, signed an agreement to establish the UAV Applications Center in NASA Research Park. The charter of the new center is to conduct collaborative research and development, leading to enhanced scientific and commercial utilization of UAVs as high-resolution imaging platforms in national airspace.

"Formation of the UAV Applications Center has led to the development of an innovative educational program that will provide a trained workforce with skills in UAV mission planning, geographic information systems (GIS) and digital image analysis," Herwitz said. "The nature of our current UAV coffee project, using an environmentally friendly, solar-powered aircraft, has an inspiring effect on students because it is so futuristic."

"I think it's a really exciting opportunity because of the new technology," said Deborah Parker, a graduate student studying GIS at Clark, who will be the first student to arrive for UAV training at Ames in September. "Emergency management and fire response is important, particularly this year with all the wildfires. It seems if you had a UAV flying up there, you could watch for advancing fire fronts, respond quicker and target your response."

"Long-duration solar-powered aircraft, able to fly for many days without landing, will develop in the future, and these students will have an opportunity to be actively involved in the early stages," said Herwitz.

Safety data for July 2002

	Civil Servants	Contractors
Not recordable		
first aid cases	5	5
Recordable no lost time cases	1	1
Restricted workday cases	0	0
Lost workday cases	0	1

Data above is as of 7/31/02. May be subject to slight adjustment in event of a new case, late reporting, or new information regarding an existing case resulting in reclassification.

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NASA-led study may improve climate change forecasts

Studies of cirrus clouds performed by some 450 scientists may lead to improved forecasts of future climate change.

In July, in southern Florida, scientists investigated high tropical cirrus clouds composed of tiny ice crystals. The scientists hope to determine how the clouds form, how they limit the amount of sunlight reaching the surface of the Earth and how they trap heat rising from the surface and lower atmosphere. This key information will help improve computer programs that forecast global climate change.



photo courtesy: Mike Phelps, Storm Photographer

A bright 'sun dog' lingers amidst the wispy cirrus clouds floating over Sanibel Island, Fla. A sun dog, a bright spot to the left or right of the sun, is created when sunlight is refracted off ice crystals in the cirrus clouds.

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

Scientists from NASA, other government agencies, academia and industry are investigating cirrus clouds in Florida with the objective of reducing uncertainties in forecasts of the Earth's future climate. High, tropical cirrus clouds are composed of tiny ice crystals that float at altitudes from 20,000 feet (6,096 meters) to 60,000 feet (18,288 meters). Scientists are taking measurements from a variety of aircraft and ground instruments for a four-to-six week period. They plan to analyze and report their data by the spring of 2003. The effort is called the Cirrus Regional Study of Tropical Anvils and Cirrus Layers - Florida Area Cirrus Experiment (CRYSTAL-FACE).

"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.

Recent observations from NASA's Terra satellite, with improved sensitivity to detect cirrus cloud systems, suggest that cirrus are present more than expected, both temporally and spatially across the planet. Cirrus may act to warm or cool the planet and the tendency toward warming or cooling depends on the extent, duration, thickness and location of the clouds.

A major scientific goal is to use cloud

measurements from aircraft to calibrate remote cloud measurements 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 improved large-scale measurements of clouds because as satellites orbit Earth, they can observe huge areas of the globe at once. These satellite cloud measurements 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 were mostly over southern Florida, and occasionally we will sample clouds over the ocean," Jensen said.

Many of the scientists and aircraft involved in CRYSTAL-FACE were based at Key West Naval Air Facility, Fla., during the experiment. Six aircraft types carried instruments to measure cirrus clouds. The high-flying ER-2 (similar to a U-2), based at NASA Dryden Flight Research Center, Edwards, Calif., conducted remote sensing of cirrus clouds and environmental conditions, as did the Proteus aircraft, built by Scaled Composites, Mojave, Calif. Scientists will compare the ER-2 instrument readings with similar satellite measurements.

The WB-57 aircraft based at NASA Johnson Space Center, Houston, made in situ measurements of cirrus clouds and environmental conditions. A Citation aircraft from the University of North Dakota made 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.

A P-3 aircraft, based at the Naval Air Station, Patuxent River, Md., and provided

by the Naval Research Laboratory, used 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., made in situ measurements of aerosols and take other readings. Ground-based instruments in the study included radar and others. Satellites included in the study will be GOES, Terra, Tropical Rainfall Measuring Mission and Aqua.

In addition to Jensen, other scientists from Ames took 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 Pilewskie and colleagues used 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 also was the lead forecaster for the mission.

Participants included researchers from various NASA centers including Ames; Goddard Space Flight Center, Greenbelt, Md.; Langley Research Center, Hampton, Va.; and the Jet Propulsion Laboratory, Pasadena, Calif. Participating government organizations include the Department of Defense Office of Naval Research, the National Science Foundation, the National Oceanic and Atmospheric Administration, the Department of Energy and the National Polar-orbiting Operational Environmental Satellite System.

A complete list of participants is on the project Web site located at: <http://cloud1.arc.nasa.gov/crystalface/>

Project manager Michael Craig of the Ames Earth Science Project Office was in charge of the field campaign for NASA. CRYSTAL-FACE was the largest mission ever run by the Earth Sciences Project Office.

This research is part of NASA's Earth Science Enterprise, a long-term research effort that utilizes the unique vantage point of space to view our home planet to better understand and protect life here, while exploring for life in the universe. CRYSTAL-FACE supports data validation of NASA satellite investigations, including EOS Terra and Aqua satellite missions and the Tropical Rainfall Measurement Mission.

A fact sheet about the mission is on the web at: <http://amesnews.arc.nasa.gov/factsheets/FS-02-03AR.html>. Publication-size images are available on the Internet at: <http://amesnews.arc.nasa.gov/releases/2002/02images/cirrusclouds/clouds.html>

BY JOHN BLUCK ▲

NASA's FutureFlight Central helps scientists study crater

Sweeping, panoramic images of the stark, barren vistas of a 23-million-year-old impact crater on Devon Island in the Canadian Arctic

Since 1997 as part of the Haughton-Mars Project (HMP), geologists and biologists have been studying the Haughton crater to learn

more about the red planet. Because of its rocky, polar-desert setting, scientists say that the remote site offers unique insights into geologic processes on Mars, the possibilities of life in extreme environments and the effects of impacts on Earth. Overlying deep permafrost, the Haughton crater on Devon Island is an excellent Mars analog (a site where environmental conditions, geologic features, biological attributes or combinations thereof approximate in some specific way those on Mars at present or earlier in that planet's history.)

On July 25, a group including Code I Deputy Director Jan Aikins, Code I Associate Director Tony Gross

Terry Allard, chief of Code IH, and Ames research scientist Mary Kaiser, visited the sophisticated simulator to view images transmitted by satellite from Devon Island to

scientists back at Ames. Although they had hoped to see the Canadian Arctic field team scientists working in real time, poor weather conditions prevented the team from setting out until late evening (where daylight lasts 24 hours at this time of year). Instead, the group saw images taken the previous day at the field test site displayed as panoramas on the simulator's 12 display screens.

Images and remote-sensing data from the Haughton crater were transmitted by satellite to FutureFlight Central so scientists could assess the value of the panoramic perspective as an aid to understanding the nature of the field site and as a means for planning a course of action for an advanced remotely-controlled robot to explore the site. "The idea is to determine what a rover, operating under optimum conditions, can see, as compared to what an astronaut would be able to see during a planetary exploration mission," Gross said.

During the field experiment, scientists were using an all-terrain vehicle operated by the field team to simulate the autonomous navigation capabilities of a 2020-era rover that astronauts in the future might deploy to explore Mars. The scientists at Ames directed the operation of three cameras on the rover, which then transmitted the images back to FutureFlight Central. Return of data from the remote sites was a complex task involving the Ames Mobile Exploration System computing and wireless communications infrastructure and a satellite link provided by Simon Fraser University and the Communication Research Centre of Canada.

Working closely on site with colleagues from Hamilton-Sundstrand Space Systems, the field team also successfully completed surveys, where the geologist wore a prototype spacesuit (which limited both vision and touch senses), at the same three sites as

continued on page 13



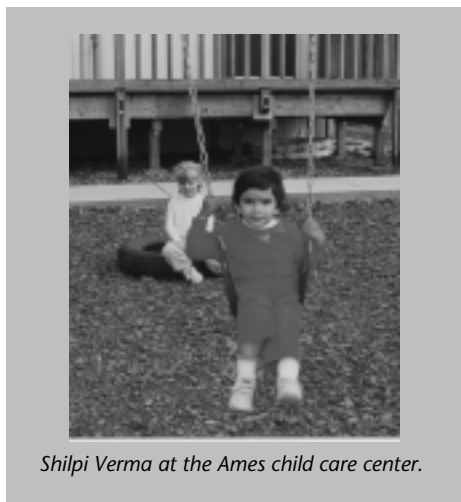
photo by Eric James

From left to right, at the FutureFlight Central facility, Geoffrey Briggs, principal investigator for the Haughton Mars project, Code I; Deputy Director Jan Aikins (in white jacket), Code I; Associate Director Tony Gross (standing at right), Code I. Sitting at computer is Jen Jasper of the QSS group.

where an Ames team was supporting a remote field experiment, recently were provided to a science team gathered in Ames' FutureFlight Central simulator.

Ames Childcare Center graduate returns as SHARP student

Shilpi Verma is one of 30 SHARP students at Ames this summer. Verma will be a senior at Mission San José High School in Fremont



Shilpi Verma at the Ames child care center.



Shilpi Verma today, working this summer with the NASA Quest team.

in September. Being at NASA Ames is a familiar experience for Verma. She has seen it all before.

Verma's mother is Sunita Verma, a chemist for Orbital Sciences, in the Astrobiology Technology Branch. Sunita enrolled her baby daughter Verma in the Ames Childcare Center before her first birthday.

After graduating the childcare center, Verma has returned to Ames many times to participate in the employee day at the Aerospace Encounter and Take our Children to Work Day programs. This summer, Verma is working in the Education Office on NASA Quest. "I have really enjoyed working here this summer with the entire Quest team. Working at NASA has been fun and I have learned a lot. Hopefully, in the future, I can come back to Ames again."

Next year, Verma will apply to college to study electrical engineering or finance/business administration. Who knows when or where she will be back at Ames next?

BY SUSAN LEE

NAFEO seeks to build bridges and create opportunities

Hundreds of student interns, mentors, faculty members and Ames employees, from a variety of backgrounds and professions, came together in the Ames auditorium on July 17 with a single goal: to hear the inspir-

and engineers and work on the highest level. America needs us to work on research and contribute to the technical knowledge of the country."

Humphries explained that NAFEO was established in 1967 to represent the interests of Historically Black Colleges and Universities (HBCUs) in response to a rigorous call for scientists and engineers in America. NAFEO promotes national and international appreciation for the contributions of HBCUs, which are symbols of excellence in education for African-Americans. NAFEO's chief objective is to implement programs and policies affecting minority students, to create more opportunities for members of the minority community, and to increase the number of black students in HBCUs. NAFEO's strength and stability account for the perpetual rise of intellectuals, professionals and creative artists so evident throughout black communities and the American society at large.

"We are at the beginning of the journey --we are building bridges," Humphries said proudly.

There are 4 million people in higher education in the United States today, of which only 5 percent are African-Americans or Hispanics. In major universities, only 74 African-Americans and Hispanics are earning doctoral degrees in science or engineering of every 6,800 graduate students. Although a small number, this is the highest number ever reached, thanks, in part, to the efforts and leadership of NAFEO. As the head of NAFEO, Humphries is working to increase the number of minority students with doctorates in technical fields. He emphasized that the premise of NAFEO is that abilities depend on exposure.

"We are doing this because we believe we have to produce our own capabilities and create our own Ph.D.s," Humphries said. "We have tried for years to get universities to produce more minority Ph.D.s, and this didn't happen. In our community, we have the capability and competency to be scientists and we will demonstrate what can be done when one is committed and dedicated," Humphries explained. "We are going to fight for the research scientists to conduct research in minority institutions as they do in major universities," he added.

Humphries pledged that NAFEO will become part of NASA Research Park and that students from HBCUs will do research work at Ames. "We will become partners. It's exciting for us, and it's promising for our future."

NAFEO includes more than 100 member institutions, which consist of two- and four-year private and public colleges and universities, graduate and professional schools located throughout the country. The organization stresses the need for a system of higher education, where race, ethnicity, socio-economic status and previous educational attainment levels are not determinants of either the quality or quantity of higher education. NAFEO offers a wide range of

programs and services for students, including internships, health education and career fairs.

Humphries became the president and CEO of NAFEO on Jan. 1, 2002. A native of Appalachicola, Fla., he graduated with a bachelor of science degree in chemistry from Florida A&M University in 1957. He was recognized as the Distinguished Military Science Graduate and subsequently served as a second lieutenant with the United States Army Security Agency for two years. In 1964, Humphries was awarded a Ph.D. degree in physical chemistry from the University of Pittsburgh. He has served as president of Tennessee State University and of Florida Agricultural and Mechanical University (FAMU), as chairman of the state board of education Advisory Committee on the Education of Blacks in Florida, and as chairman of the board of regents at the state university system of Florida. Under his leadership, FAMU was recognized as one of the nation's premier institutions of higher learning.

For his outstanding leadership, determination, achievements, professional expertise and numerous valuable contributions, Humphries has received a number of significant honors including the University of Pittsburgh Bicentennial Medal and the Thurgood Marshall Educational Achievement Award.

Humphries' talk at Ames was positive and encouraging as he emphasized that his ultimate goal is to provide scientists and engineers to meet the needs of American society among both minority and non-minority citizens. Looking toward the diverse crowd, Humphries concluded his speech, by igniting the group with this closing statement: "And so we begin our journey..."

Immediately following his talk, Humphries, accompanied by faculty and staff from several of NAFEO's member institutions, joined Ames Director Dr. Henry McDonald for a brief reception. Countless students, university faculty and Ames employees continued in a more informal setting the discussion of "Building Bridges-Creating Opportunities."

By VERONIKA SOUKHOVITSKAYA ▲



photo by Dominic Hart

Dr. Fredrick S. Humphries, president and CEO of the National Association for Equal Opportunity in Higher Education (NAFEO), presented a lecture at Ames on July 17.

ing words of Dr. Frederick S. Humphries as he spoke about 'Building Bridges - Creating Opportunities' in higher education.

Humphries, president and chief executive officer of the National Association for Equal Opportunity in Higher Education (NAFEO), talked about the importance of America's young people earning doctoral degrees in science and engineering to continue the nation's progress and advances in technology. Although his words were directed at every student in America, Humphries focused on creating opportunities for minority students, African-Americans and Hispanics in particular. Ames' Education Office and the African-American Advisory Group co-sponsored the event.

"We are entitled to participate by virtue of being American citizens, to go beyond stars, to produce Nobel Prize winners because we can think," Humphries declared. "There is no doubt that we can be scientists

Ames bowling league starts

Attention bowlers, the Ames Bowling League starts on Sept. 3. The league bowls at the Palo Alto Bowl on Tuesday nights and is looking for full-time bowlers to fill out the teams and substitute bowlers as well.

There will be a pre-league meeting at Palo Alto Bowl on Aug. 26 at 6:00 p.m. If you have questions about the bowling league, or wish to sign up, contact Toby Garcia at ext. 4-1382, or email at tgarcia@mail.arc.nasa.gov.

Ames Retirements

Name	Code	Date
Margaret Kane	FO	6-29-02
John E. Greenleaf	SLR	6-29-02
Cathy A. Pochel	DK	8-02-02
Robert W. King	FM	8-02-02
John D. Foster	AFA	8-31-02
Jack Franklin	ARH	9-03-02

High school students to control Web telescope in Chile

In just a few months, a group of U.S. high school students will be able to view the night sky from south of the equator as they 'beta' test a remote-control telescope in Chile via the Internet.



Mark Leon, Code D, working on the remote control and communications of the 14-inch telescope.

By mid 2003, students nationwide will be able to control the telescope and charge-coupled device (CCD) cameras in real time via the World Wide Web to observe celestial objects from Las Campanas, Chile. The CCD cameras are similar to consumer digital cameras but are more sensitive. In addition, NASA's Telescopes in Education (TIE) program will provide access to the telescope by international scholars. TIE, Pasadena, Calif., deployed the 14-inch telescope, and NASA provided a CCD camera.

"This facility represents a fundamental breakthrough for high school students, enabling them to access a remotely controlled observatory located in the Southern Hemisphere," said Mark Leon, learning technologies project manager of the Southern Telescopes in Education Project at Ames.

The program enables students to increase their knowledge of astronomy, astrophysics and mathematics; improve their computer literacy; and strengthen their critical thinking skills, according to Leon. In addition to U.S. students, the program is collaborating with Chilean academia and high schools.

Hands-on training in Chile as well as on-line Internet interviews and presentations will be part of the program. Organizers hope to provide educators with this training so they can integrate hands-on astronomy into their science curricula.

The project in Chile was inspired by TIE, which in 1998 automated a telescope at Mount Wilson Observatory in southern California to operate remotely via the Internet. Earlier, in 1993, the TIE facility began operating via direct modem dial-up connections. The system at Mount Wilson enables students to conduct research, make discoveries in astronomy and astrophysics and publish these discoveries in science journals and other media. Students remotely control the telescope in California using special software and can see and hear the telescope move via live audio and video Internet links.

In September 1999, an investigative team visited Chile to initiate a collaboration to

begin the process of setting up a telescope aimed at the southern skies. The observatories of the Carnegie Institution of Washington and NASA Ames agreed to establish the Southern TIE effort. NASA signed a memorandum with the Carnegie Institution of Washington to formalize the project.

Miqueil Roth, director of the Carnegie Institution of Washington Observatory, Las Campanas, Chile, is managing the program in Chile. Leon is the NASA Ames manager for the Chilean project.

More information about the Southern Telescopes in Education Program in Chile can be found on the World Wide Web at:

<http://learn.arc.nasa.gov/events/chile/>
TIE is a program sponsored by NASA and developed through the efforts of numerous volunteers, businesses and supporting organizations including the NASA Jet Propulsion Laboratory, California Institute of Technology, Pasadena, Calif. The Learning Technology Program, a part of NASA's Education Technology Program, funds the TIE program.

High-resolution images are on the Internet at: <http://www.amesnews.arc.nasa.gov/releases/2002/02images/chiltelescope/chilean.html>

BY JOHN BLUCK ▲

NASA exhibit draws many at local fair

NASA Ames participated in the Alameda County Fair this past June. Over 18,020 fair attendees visited the NASA Ames display, which included an Apollo 16 moon rock,

hydroponic gardening and a comparison display of Earth, Mars and Europa.

photos by Tom Trower



Hydroponics unit is shown growing plants along with plants growing in simulated martian soil.



Apollo 16 lunar sample and backdrop is shown at the Ames exhibit that was on display at the recent Alameda County Fair.



Display discussing the techniques and benefits of hydroponic gardening is viewed by a fair attendee.

Ames' employee completes 100-mile endurance run

The Tevis Cup, which started in 1955, was a 100-mile horseback endurance ride on a portion of the Western States Trail from Squaw Valley, Calif., to Auburn, Calif. In 1974, rider Gordon Ainsleigh's horse came up lame two weeks before the event. Gordon decided to attempt the distance on foot.



photo by Facchino Photography

Tom Kaisersatt, Code ARH, Raytheon, 2002 Western States 100 mile endurance run finisher, is shown at Cougar Rock, mile 13 into the event.

Thus was started the modern day 100-mile trail endurance runs. There are over 30 such events in North America, some more difficult than the Western States Endurance Run, but Western States was the first. Since 1979, more runners apply each year for the event than the Forest Service will allow, consequently there is a lottery to get in. As of this June 30, 5,122 runners have completed the run.

The Western States Endurance Run traverses the middle portion of the historic Western States Trail, which stretches from Salt Lake City, Utah, to Sacramento, Calif. First used by the Paiute and Washoe Indians, the trail was later indelibly imprinted upon the high mountain ridges and through the deep river canyons by the boots of the '49ers and the hooves of their horses and mules. For many years, the trail served as the most direct route between the gold camps of California and the silver mines of Nevada. Today, although portions of the trail follow dirt roads and three miles are on pavement, most of the trail remains natural and wild.

The Western States Endurance Run climbs approximately 18,000 vertical feet and descends another 22,000 feet from start to finish. Much of the footing is poor and temperatures can range from below freezing to well over 100 degrees. This year, there was virtually no snow, the author taking a mere 46 steps on packed snow. The temperatures were warm, but not hot. I carried

a light jacket during the night but never put it on. Crossing the Middle Fork of the American River at night was quite refreshing with the water reaching about waist deep in places.

There are 24 aid stations along the route where runners can refill their water bottles and take on nourishment. Nine of the aid stations are medical aid stations where the runners are weighed to determine their hydration level. If under weight, they must take on fluids prior to being released back on the course, or possibly face mandatory withdrawal. My weight varied between 163-171 from a start of 168 lbs., I finished at 165 lbs.

The term 'buckleing' refers to finishing the event in less than 24 hours, for which you receive a silver buckle. A bronze buckle is awarded to those finishing in less than 30 hours. Historically, about 20 percent of the starters finish in less than 24 hours and approximately 68 percent finish in less than 30 hours. Tim Twietmeyer has finished in less than 24 hours, 21 times, winning five times. Gordon Ainsleigh, the first ever runner, is still running it and has finished 17 times. Ann Trason has entered the event 14 times and has won the woman's division 13 times, one time finishing second overall, only five minutes behind the first man.

This year was my third attempt. In 1996, I withdrew at mile 62 and in 1997, mile 55. I am most happy to have finished this year with a time of 29:54:17. The winning time was 16:19:10 by Scott Jurek, his fourth consecutive win. One of the most frequently asked questions is "When do you sleep?" One does not normally sleep during the race. I was up at 3:00 a.m. on Saturday morning for a 5:00 a.m. start from Squaw Valley. My goal was to be in Auburn before 11:00 a.m. the next day. I finally went to bed at 7:30

p.m. on Sunday. Of course, another question asked is "Why?" It just seems like the next level of challenge after completing marathons, 50 kilometer and 50 mile trail runs.

What would I do differently if I ran it again? Probably take a little better care of my feet. I did not change shoes after the river crossing at mile 78 because I was confused as to how I was doing with respect to the typical 30 hour finisher. I thought I was behind when in fact I was 30 minutes ahead. I had shoes available after the river crossing, they were dry and a little larger to accommodate my swollen feet. I feel that because I did not change shoes my feet suffered the last 20 miles. My spirits were high for the complete race, even when I got sick on the trail at about 50 miles, I just knew everything would get better. There was a tremendous amount of support from people I knew. My running club works the 'Last Chance Aid Station' at mile 43. There was so much cheering when I arrived four and one half hours after the leaders typically pass through that I thought everyone ahead of me had dropped and I was leading! I picked up my long-time running friend, Gayla Johnson, at mile 55 to pace me through the night and to the finish. Johnson has entered and finished the event four times with one finish of 23:06. When I arrived in Auburn for the final lap around the track at Placer High School, there were at least 20 friends waiting to join me on the track. A strange thing happened, I don't recall my feet hurting any more!

My favorite ultra marathon quotes from unknown persons are:

"Eat like a horse, drink like a fish, run like a turtle." Another, "And there I was, hammering up the hill, passing those rocks and trees as though they were standing still." Also, "Keep the rubber side down".

BY TOM KAISERSATT ▲

WebTADS here, Travel Manager coming

The implementation of WebTADS, the Web-based time and attendance distribution system, was successfully completed at Ames during the pay period ending July 13. All NASA civil servants at Ames are now using WebTADS to record their time.

As with most software systems, there are program upgrades and enhancements to be expected. Important program improvements can be anticipated in the next few months. Information about these improvements will be provided in centerwide e-mails and on the Ames WebTADS web site at www.webtads.arc.nasa.gov.

Ames employees should continue to direct questions and problems with WebTADS to the Help Desk at ext. 4-2000. If you require additional training on WebTADS, watch the monthly training announcement for information about future classes.

Early in 2003, Ames will be implementing Travel Manager to automate the travel authorization and voucher process. Travel Manager is a commercial-off-the-shelf (COTS) software package used to automate the travel process in organizations. Travel Manager,

designed by Gelco Inc., is the predominate commercial software package in use by many organizations in the federal government.

Travel Manager will change the way travel authorizations and vouchers are created and approved. These changes will bring numerous improvements to the overall travel process. The improvements will include:

- For preparers and travelers, preparation of travel authorizations will be both quicker and easier.

- Traveler personal data will be maintained in the system and can be used to pre-fill all relevant information on travel documents, instead of entering all data multiple times.

- The travel voucher can be generated from a travel authorization, eliminating the entry of much duplicate data from the authorization.

- Travel Manager will calculate per diem rates based on destination.

- Electronic routing and signatures will speed up processing time.

Watch for more information about this exciting program in the coming months.

NASA's Blumberg chronicles 'The Hunt for a Killer Virus'

Some 375 million people have long-term hepatitis B (HBV) infections, and this disease has caused the death of more people than AIDS. Half of the Earth's human population may have been infected by the HBV virus. It causes additional suffering because it often leads to liver cancer that afflicts millions.

One person who was involved in the discovery of the deadly virus and the invention of an effective vaccine against it is Dr. Baruch Blumberg, M.D., now director of the NASA Astrobiology Institute at Ames. His role in the decades-long effort to conquer the malady won him the 1976 Nobel Prize in Physiology or Medicine. The story of the work to defeat HBV is chronicled in his recent book, "The Hunt for a Killer Virus, Hepatitis B," Princeton University Press, 2002.

"The primary reason I wrote the book was to inform the general public on how scientists, at least one scientist, accomplishes scientific work," Blumberg said. "A secondary reason I wrote it is to explain to young scientists the scientific process that I and many scientists use."

In his book, Blumberg compares the initial phase of the scientific process to the way a physician notes symptoms to make a diagnosis. In the inductive phase, scientists "collect data and formulate a hypothesis." In this first "phase of science" there is only a preliminary idea where the research is going.

In the next, deductive phase, a scientist states a specific hypothesis, and designs experiments to prove or reject it. "If a hypothesis is tested many times and is not rejected, and the experimenter is satisfied that subsequent experiments are unlikely to reject it, then it can be accepted as if it were true," Blumberg wrote.

Whether or not the data support the original hypothesis, a researcher could use that data to make a new hypothesis. "Usually, one or more of the 'new' hypotheses will be a modified restatement of the original, now rejected hypothesis, enriched by the new information obtained as a consequence of the experiment," Blumberg explained in the book.

"I tell the people in the NASA Astrobiology Institute, I don't expect them to do exactly what they said they'd do because new ideas emerge as you do science, and you want to be able to follow new ideas," he explained.

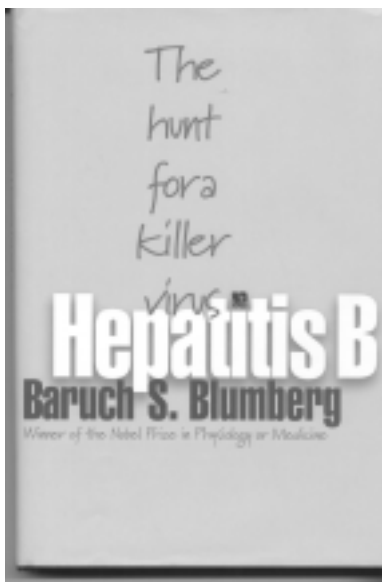
"The book also shows science as an adventure," he said. "A lot of it's luck, too."

"It is a common experience of scientists that unexpected data are often the most interesting because they generate totally new kinds of ideas," Blumberg wrote. "Recognizing this, we began to organize our study design so as to produce unexpected results. This may seem semantically facetious—if you expect something unexpected, can it really be unexpected?—but it works."

Blumberg described how a "circuitous route" often leads to discovery. When he worked in a hospital in New York City, he first became interested in the responses to dis-

ease by different ethnic groups.

"People who were, apparently, equally exposed to a disease-causing agent, such as a bacterium or a virus, could respond very differently. Some would remain healthy, while others sickened; some would respond well to treatment, while others would not," Blumberg wrote. "The effect of environment also was obvious: people who lived in favored regions were less likely to be exposed to disease-causing agents than those who lived in other, less salubrious, parts of the world. But the significance of this had not truly registered on my consciousness. Wanderlust was the conduit to my next step."



In August 1950 Blumberg traveled to Suriname, also called Dutch Guiana, located on the northern coast of South America. There he and a colleague spent three months at a hospital and public health facilities at a large aluminum mine. The company town was a "model of good public health in an area where endemic diseases—malaria, intestinal parasites and bacteria, tuberculosis, yaws, filariasis (the cause of elephantiasis)—and a variety of other serious illnesses prevailed."

Clean food, proper plumbing and insect control diminished disease in the town. Also, mosquito-borne diseases were not transmitted there. "However, many of the employees brought . . . infectious diseases with them when they came into the community. Moengo was a heterogeneous society comprising individuals from many parts of the globe with different prior environmental exposures and representing different gene pools," Blumberg wrote. "It was an excellent place to observe differences in response to infectious agents."

Blumberg said studies of elephantiasis in Suriname were most interesting. Mosquitoes carry tiny filarial worms that get into the human bloodstream and organs. An infected person's immune response may inflame the blood vessels and lymph system resulting in swelling and sometimes in enlargement of

arms, legs and other body parts. Worldwide, elephantiasis may infect 120 million people, according to a 1998 report.

"A fascinating feature of filariasis is that many of those infected do not become obviously ill but have large numbers of the organisms (the microfilaria form) in their blood. That is, they are 'carriers' of the organism although they themselves are not ill," explained Blumberg. If a carrier is bitten by a mosquito that also bites another person, the disease can be spread. Blumberg said that the pattern of infection of elephantiasis is analogous to the carrier status of hepatitis.

Blumberg and his colleague found that there were more microfilaria carriers among those people who were of mixed African and European descent than those who were of Javanese, American Indian, Chinese or European/American origin.

"At this early period of my life as a scientist, questions arose that would intrigue and excite me for years to come. How do inheritance, human behavior and the environment interrelate in the context of disease? At one extreme there is a completely deterministic interpretation: genes determine outcome and biology is destiny. At the other stands the view that factors in the environment and human and population behavior influence outcome," Blumberg recounted.

He said that his time in Suriname taught him valuable scientific methods that would have a strong effect on his later hepatitis research. "I learned to rely on observations in the field; new observations led to new hypotheses that could not have been induced by laboratory-based experiments," he wrote. But fieldwork still was very dependent upon laboratory experiments that would confirm or reject hypotheses, he added.

Much of the rest of Blumberg's book tells how he and co-researchers traveled around the world to sample blood from diverse populations, made hypotheses and carried out tests in search of the cause and cure for hepatitis B. Observing different responses to the disease by different groups of people is one of the keys to the intriguing research, much of which took place before current knowledge of the human genome was available. He describes in detail the years of detective work that he, colleagues and people around the world conducted which took a meandering pathway leading to discovery of the virus and a vaccine to combat it.

In his closing pages Blumberg writes about many more questions that have arisen as a result of hepatitis B research that may impact the studies of other diseases including forms of cancer. Can insects, bedbugs, carry HBV?

"Could insects transmitting HBV carry with them small segments of the hosts' DNA sequences? Could insects act as a mechanism to transfer genetic material from one human to another, without sexual reproduction, and thus have an effect on the evolutionary history of the species they bite? Granted, conjectural, but conjecture is part of the fun of science," Blumberg wrote.

BY JOHN BLUCK ▲

NASA interactive training tool to make flying safer

A unique and revolutionary aviation training tool, available to everyone on the Internet, is making general aviation safer than ever by helping pilots manage fatigue.



Pilots who fly general aviation aircraft like the one pictured above are using a new online fatigue countermeasures training tool.

The interactive, online general aviation education and training module provides information for general aviation pilots about how to manage 'alertness' issues during flight operations. The Fatigue Countermeasures Group at Ames created the module to mitigate incidents and accidents due to fatigue. Dr. Melissa Mallis of Ames is the project's principal investigator.

"This easy-to-use, hands-on module is designed for people in complex environments, facing challenging schedules, yet seeking to enhance safety," said Ray Oyung, a senior research associate in Ames' Information Sciences and Technology Directorate.

The primary audiences for this online training are commercial and general aviation pilots, but the training also can be beneficial to aviation managers, mechanics, medical flight crews and law enforcement personnel. Topics discussed during the training include causes of fatigue and strategies to help manage it, the importance of sleep, factors associated with sleep loss, sleepiness, circadian rhythms and signs of fatigue.

The training module can be completed in 40 minutes, but it also is broken down into segments for shorter, more tailored and recurrent viewing sessions. The system requirements to complete training on the Internet are a Macromedia Flash 5 Player and Netscape Navigator, version 3.0 or higher.

The Web-based version of the training was created to reach more people, with a focus on general aviation pilots who may not have easy access to this type of information. Fatigue countermeasures training previously was available only at two-day workshops conducted at Ames and attended heavily by the commercial airline community.

"This valuable training is meant to be spread and shared with others to increase safety--everywhere, for everybody, at all times," said Oyung.

The Ames Fatigue Countermeasures Group was created in 1980 in response to a congressional concern about safety in aviation related to flying long or rapidly recurring flight segments and the resultant crew fatigue. Since that time, Ames researchers have

conducted studies in a variety of full-mission flight simulations, aviation field studies and space-related research.

Since 1993, Ames researchers have conducted 34 two-day workshops with nearly 700 attendees and 240 organizations from 21 countries. Development of the general aviation education and training module started in 1999.

To access the online training, visit <http://human-factors.arc.nasa.gov/zteam/fcp/WebGA-ETM.intro.html> More information about the NASA Ames Fatigue Countermeasures Group is available at <http://human-factors.arc.nasa.gov/zteam/>

BY JONAS DINO/
VERONIKA SOUKHOVITSKAYA

UAV center to train students

continued from page 5

Initially, he plans to develop classes in UAV technology and aerial image analysis using a videoconference system that will connect university students with the new UAV Applications Center.

"The program will produce a significant return on investment," Herwitz said. "Its benefits may include such things as protecting the environment and natural disaster response and mitigation. We are also inspiring the next generation by involving them in the future of UAVs."

The first demonstration site will be the largest coffee plantation in the U.S., located on the Hawaiian island of Kauai. The project will use a lightweight solar-powered flying wing called the Pathfinder Plus, developed for NASA Dryden Flight Research Center by

AeroVironment, Inc., Monrovia, Calif.

Visit <http://www.clarku.edu/faculty/herwitz/> for details about the UAV coffee project. Future demonstrations will show the utility of UAVs for high-resolution imaging systems in situations requiring timely aerial imagery on the ground.

Further information about Clark is available at <http://www.clarku.edu>. For information about the NASA Research Park, you can visit the project Web site at <http://researchpark.arc.nasa.gov>. Publication-size images of the signing ceremony and UAV coffee project are available at <http://amesnews.arc.nasa.gov/releases/2002/02images/coffee/coffee.html>.

BY JOHN BLUCK

AAE hosts Ames employee day

The Ames Aerospace Encounter hosted its 16th Ames Employee Day on July 30. All on-site personnel were invited to come, along with family and friends,

city that makes math and science come alive.

The Encounter is booked year round with 4th, 5th & 6th grade student fieldtrips. It is managed by the Education Office, Office of Public Affairs, Code DX. For more information about the Encounter visit its Web site at encounter.arc.nasa.gov



for a self-paced tour. Over 160 adults and children, representing over 29 codes, attended.

This was a special opportunity for employees, their children and their guests to experience this unique interactive fa-



photos by Roger Brimmer

Summer students' reception marks a great success

A jazz band playing and the beauty of a summer's day on the outside patio of the Moffett Training and Conference Center welcomed student interns and their mentors on July 23 to celebrate the successful summer internships of minority students at Ames.

The reception, which was organized by Ames' African-American Advisory Group (AAAG), gave students and their mentors an opportunity to meet new people and share their experiences at Ames. The program included talks by Dr. Henry McDonald, Ames' Center Director; Donald James, director of Ames' Education Office; and Sheila Johnson, community relations coordinator in Ames' Office of Public Affairs. The program also featured the talents of several of the student interns.

There were students from dozens of educational programs at Ames, including the Astrobiology Academy, Undergraduate Student Research program, Minority University

Research and Education programs, Education Associates program and Summer Stu-



Sheila Johnson, Public Affairs, Code DXC, (left) with Center Director Henry McDonald as he speaks at the recent Ames African-American Advisory Group student reception.

dent Employment Program. Also attending were employees from various departments at Ames, including public affairs, aerospace technology, information systems, astrobiology and space research, who devoted their time this summer to educating and "inspiring the next generation of future explorers."

The program opened with optimistic

words by McDonald. "We are here to encourage and inspire young people and widen their horizons," he said. McDonald also invited the students to provide feedback about their experiences at Ames.

"Today is about rhyme, rhythm and reason," said Johnson, who coordinated the event. She highlighted some of the work of



photos by Dominic Hart

Participants at the recent AAAG sponsored student reception.

the AAAG, which has served Ames' minority employees for more than 30 years. In recognition and appreciation of his service, she thanked the immediate past president of the AAAG, Robert Finnie, and interim chair Brenda Collins, for their leadership and dedication. Johnson also introduced Lewis Braxton III, a role model for many of the young people. Braxton started as a co-op student and now is Ames' chief financial officer.

As part of the talent show, Kia Smith, Ecleamux Ricks and Louis Mazziotta read original poems. "...The true joy of life is the trip. The station is only a dream..." read Ricks as other students and employees listened attentively. Another student, Paul Delgado, played an electric guitar and sang a song he had written. The talent show was greeted with warm applause from attendees.

James closed the formal program with an upbeat message for the students. "As you close this summer season, try to meet as many people in this agency as possible -- students in your and other educational programs and people working in other departments," he said. "I hope you stay in contact with us." James thanked all for their contributions and support this summer. "You have made a difference to me and other folks just by being here," he said.

The jazz quartet, called Russell and Friends, made the event even more enjoyable. The band played several classic jazz songs. The view of Hangar One, the mountain ranges in the distance, sunny weather, jazz music enveloping the crowd, and delicious food, prepared and served by Robert Finnie, created a perfect atmosphere for the celebration.

BY VERONIKA SOUKHOVITSKAYA ▲

NASA FutureFlight Central helps scientists study crater

continued from page 7

were surveyed by the Ames science team in the earlier rover simulation. The results from the two surveys can now be compared.

The experiment is part of the Human Operated Robotic Science Evaluation (HORSE) project that seeks to learn how well scientists can carry out an exploration of several sites at Haughton by remote means. Analysis of the experiment results will now begin. One thing is already clear, "our science team found that the panoramic perspective of FutureFlight Central provided them with excellent situational awareness," said Geoffrey Briggs, project principal investigator.

The HORSE project was initiated in March 2002, in support of the agency-wide NASA Exploration Team (NEXT) Human-Robotic working group. The project builds on a prior science study conducted in 2001 at the Haughton impact crater and on three years of mobile exploration systems development and field testing conducted at Haughton.

Brian Glass is the HORSE project manager; he was supported in the field by Rick Alena and Victor Rundquist. The science

team operations at Ames were supported by Lori Blaauw, Jennifer Jasper, Samantha Domville and Badi Azad. Planetary scientist Kelly Snook from Ames, and geologists professor Jeffrey Moersch of the University of Tennessee and professor James Saunders of Auburn University made up the science team.

The Haughton Mars Project is a SETI led international field research program centered on the scientific study of the Haughton impact crater and its surroundings on Devon Island, located in Nunavut, in the Canadian high arctic. The scientific field studies conducted at Haughton also are used to support exploration research and to investigate the technologies, strategies, human factors and hardware designs relevant to the future exploration of Mars by robots and humans.

HMP 2002 is the project's sixth field season and will continue through the second week of August. The HMP principal investigator is Pascal Lee of the SETI Institute. HMP 2002 science and exploration team co-investigators from Ames include Brian Glass, Jeffrey Moore, Chris McKay and Kelly Snook.

BY MICHAEL MEWHINNEY ▲

Ames' Holton honored for microgravity research

For Emily Holton, the third time really was the charm. Recently, after a third nomination, Dr. Emily Holton was finally awarded the H. Julian Allen Award. Holton is a scientist in Ames' Life Sciences Division (Code SL).

Holton received the 2001 award in recognition of her 1979 paper "Space flight and Bone Turnover: Correlation with a New Rat Model of Weightlessness," published in the journal *Bioscience*. The original model focused on the response of the musculoskeletal system to the 'unloading' of the hindquarters of rats, simulating the response to space flight. Recent publications have investigated the recovery from unloading or simulated space flight.

Since her paper was published, the number of researchers using the model or reviewing data from the model has grown almost exponentially. The first 6 years following publication of the original paper, only 50 papers appeared, while in the last 6 years almost 400 papers have been published that use or discuss this model for simulating weightlessness. "The excitement is realizing that you have made a unique contribution to science," Holton said. She said the proposal for the model raised some eyebrows at first, so she is satisfied to see it currently used in many laboratories around the world.

When asked how she felt about winning the award, Holton beamed. "It's really an incredible honor," she confided. "I'm thrilled that a life scientist has finally gotten the award--we are making a contribution to NASA. It just takes longer for the significance of a life sciences contribution to be realized."

Although it may seem as though Holton made this achievement single-handedly, she tends to disagree. "The model has been developed by inputs from multiple investigators," Holton asserted. "You have to keep your ears open and try not to feel such a sense of ownership that you become rigid and unwilling to accept change." Apparently teamwork is not a new venture for Holton, as she lists her collaborators at the very beginning of her lectures to stress the fact that the whole is only the sum of its many parts.

Holton became interested in gravity when she moved to the eastern shore of Maryland in the late 1960s from Indianapolis, where she was an assistant professor of pharmacology at Indiana University Medical School. Working side by side with engineers at Wallops Island, she provided biological information that was critical for engineers designing autonomous biological satellites and probes. Her ability to communicate with engineers and her appreciation for scientific research were essential when she transferred to NASA Ames in 1973. Recently she stepped down from her position as chief of the Gravitational Research Branch to return to her first love -- scientific research.

"Many people don't understand why I would give up my big office for a smaller, shared one with no windows, but I would

rather be in a setting where I can be intellectually stimulated and talk about cutting-edge scientific issues with my office mate than be all by myself," Holton said. As a woman of her experience and achievement, she enjoys mentoring students, and her everyday joy seems to emanate from the brilliance of her colleagues.

As she nears retirement, Holton's affection for her work is not fading. "Science is a full time job. It's not only 9-5, and it takes reflection time," said Holton. "I think I have been so fortunate," she said. "Because of my work at NASA, I have been able to travel all over the world."

For now, Holton enjoys collaborative research projects and is working hard to convince NASA that a funded intramural life sciences program is crucial for the integrity of NASA biological research. Last year, she was one of the Ames representatives on a headquarters committee to define the role of the scientist within NASA and helped craft

the phrases "NASA needs in-house scientists. They provide a knowledge base and service that cannot be replaced with institute scientists. NASA scientists work on emerging scientific disciplines and on projects that may not be commercially viable for some time. For this knowledge base to thrive, the agency must invest resources in scientists" for the executive summary of the final committee report.

The present award was established in 1969 and named for H. Julian Allen, who served as director of NASA Ames from 1965 to 1969. He is best known for his "blunt body theory" of aerodynamics, which revolutionized the fundamental design of ballistic missile re-entry shapes. The annual award recognizes the published scientific or engineering paper of outstanding technical merit and significance. It must have had significant impact on the field. Author(s) of the winning paper share a \$5,000 honorarium and present a lecture at Ames.

BY CARLY SCHNEIDER ▲

Air Expo draws crowds to Moffett



photos by Jon-Pierre Wiens

US Senate confirms Frederick D. Gregory

-- NASA'S first African-American Deputy Administrator awaits President's approval

The U.S. Senate has confirmed Frederick D. Gregory as NASA Deputy Administrator. Gregory, a veteran space shuttle commander who previously served as the Associate Ad-



NASA Deputy Administrator
Frederick D. Gregory

ministrator for Space Flight, is set to become the agency's first African-American deputy.

The confirmation goes back to the White House for the president's signature. Gregory

must be sworn into office before he assumes his new position.

"I couldn't be happier for Fred. His considerable experience as an astronaut and aviator, and his leadership in space flight safety are needed at this critical time for the agency," said NASA Administrator Sean O'Keefe.

It's the first time in more than a decade that the Deputy Administrator position has been filled. Gregory will serve as the chief operating officer for the agency and report directly to Administrator O'Keefe. He will be responsible for directing and managing many of the programs as well as the day-to-day operations and activities at NASA.

Before being named Associate Administrator for Space Flight in December 2001, Gregory served as Associate Administrator for Safety and Mission Assurance and was charged with the oversight of all safety issues within NASA. He developed, implemented and managed quality assurance policies that dealt with reliability and maintainability.

"This is an incredible opportunity," Gregory said after hearing of the Senate's vote. "I appreciate the president's confidence and I'm thankful for the Senate's speedy consideration. We have a lot of work to do and I'm confident we'll be able to continue NASA's historic legacy of accomplishment."

As a NASA astronaut, Gregory logged

more than 455 hours in space during three space shuttle missions. In 1985, he served as pilot on board Challenger during STS-51B. Gregory was mission commander for STS-33 in 1989 and STS-44 in 1991.

Gregory was selected as an astronaut in 1978, after a distinguished career with the U.S. Air Force. He logged nearly 7,000 hours in 50 types of aircraft, including 550 combat missions over Vietnam. He retired as a colonel in December 1993.

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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.

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>
Aug. 28	Sept. 2002
Sept. 25	Oct. 2002
Oct. 30	Nov. 2002



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