

# Astrogram

Explore. Discover. Understand.

NASA

## NASA Administrator Michael Griffin visits Ames -- fields questions from employees, news media

During his first official visit to Ames as NASA's new administrator on May 23, Michael Griffin assured both em-

Griffin quipped. "Certainly, this is my official visit as administrator," he said, "but not the first time I've been here." He

possible." He added that he is "a fan of modular design," and later continued, "Having a modular design . . . you can (add) systemic upgrades when those technologies come around."

CEV designers "have to decide if it's re-useable or expendable," according to Griffin. "If it's expendable, then I'm not so worried about modular design," he said.

In response another question about roles and responsibilities, Griffin noted that "NASA is a research and development institution for the nation." He added, "We exist to do public good on public dollars." Some have said the role (of NASA) is just to farm out work to private industry, according to Griffin. "That is a part of what we do, but I don't believe it's the most important thing we do," he ventured.

He added that people at NASA cannot be effective stewards of public *continued on page 10*



NASA photo by Tom Trower

NASA Administrator Michael Griffin visited NASA Ames Research Center on May 23. During his visit, Griffin met with Ames senior management, held a media opportunity in the Exploration Center with Bay Area news media, met with Ames employees during a town hall meeting in the main auditorium and toured a variety of key research facilities, where he met with scientists and discussed their research. Shown with Griffin (center) is Ames Center Director G. Scott Hubbard (right) and Ames scientist Carol Stoker (left). Also shown behind Griffin are (left to right) Ames scientist Chris McKay, Ames Deputy Director for Research Steve Zornetzer and Ames Deputy Center Director Stan Newberry.

ployees and visiting reporters that Ames will not close, although a change of direction and some hardship are on the horizon.

Ames Director G. Scott Hubbard introduced Griffin to employees in the Center's main auditorium. "Today is a great day. We have a visitor who needs no introduction," Hubbard said. Griffin looked casual and relaxed as Hubbard noted that "It's a delight to introduce our new administrator."

The auditorium was jammed and people were animated as Griffin sat down on a stool on the stage. "You didn't provide anything I could slouch with,"

explained that he had been at Ames when he was working on his graduate thesis about computational fluid dynamics.

"This is your time... It's your opportunity to ask questions," Griffin noting, declining to give any opening remarks.

The first questioner asked the administrator's thoughts about upgraded technologies and the Crew Exploration Vehicle (CEV) being developed to replace the space shuttle.

"We've got a team of people working that issue," Griffin said, and he presented a "couple of thoughts... It is important to bring a CEV on as soon as

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## Hubbard optimistic about NASA Administrator and Ames' future

There's a new NASA Administrator at the helm of the good ship Transformation, and while there may be some stormy seas ahead, it looks like much smoother sailing for Ames. That was the prediction of Ames Center Director G. Scott Hubbard just weeks prior to Mike Griffin's first visit to Ames as NASA administrator.



NASA photo by Tom Trower

NASA Ames Center Director G. Scott Hubbard at the April All Hands at Ames.

Thanks to the leadership of the newly appointed Griffin, whom Hubbard has known since 1989 and "maintained a good collegial relationship with over the past 16 years," Hubbard told a standing-room only crowd gathered in the main auditorium on April 26 that the Center's future looks promising.

"He's a truly fine individual and very bright, as witnessed by his many degrees," Hubbard said. "I feel very upbeat about his appointment as administrator and I look forward to working with him."

However, although Hubbard said he was optimistic about Ames' future, he warned that there are still some challenges that lie ahead. "Many of our challenges are still there, but I feel very upbeat about where we are going," Hubbard ventured.

Along with the new administrator, Hubbard said that there also have been several other significant changes made at NASA Headquarters that bode well for Ames over the course of the next three years and nine months – the term of Griffin's appointment by President George W. Bush.

Center directors now report directly to Griffin, rather than to the Headquarters directorate associate administrators as they did previously under Griffin's predecessor, Sean O'Keefe. Hubbard said this will facilitate a "matrix approach" to the interaction between policy set by associate administrators, and the science and technical expertise of the center directors.

Management of day-to-day activities will be handled by a new associate administrator, the third highest administrator at NASA Headquarters.

Courtney Stadd will temporarily serve in the new job until a permanent successor is named.

Another major change at NASA Headquarters cited by Hubbard is the creation of a new Program Analysis and Evaluation Office, headed by Scott Pace, which will be responsible for advanced and strategic planning, budgeting and cost analysis for the agency.

NASA's advisory committees, including the Aerospace Advisory Panel, will be reconfigured into a single unit and will report directly to Griffin. The Office of Education will now report to the Office of Strategic Communications, which will include the offices of public affairs, legislative affairs, internal affairs and education.

Other changes noted by Hubbard include a policy to pay budget 'earmarks' as early as possible; an effort to provide 'feedback loops' to determine whether any change is occurring in NASA's culture; and a new focus on enabling employees to be free to engage in open, technical dialog. A new team will be formed to travel to field centers to study the culture changes and report back to Pace.

Hubbard said Griffin has made a commitment to meet the international obligations for the space station and to retire the space shuttle by 2010. He said Griffin has appointed Pat Ladner to study the need to re-orient the current space shuttle manifest for its best possible use.

In the Crew Exploration Vehicle (CEV) program, Griffin said the gap in human spaceflight capabilities between 2010 when the space shuttle is retired and 2015 when the CEV is expected to be completed is "unacceptable."

Hubbard said Griffin wants to "push the CEV development earlier, and close the gap when the shuttle is retired." Although the CEV Request for Proposals (RFP) is still planned to go forward, Hubbard said, "it will be modified a bit for the earlier timeframe."

Hubbard said Griffin has appointed Chris Shank and astronaut Marsha Ivins to work with field center systems engineers to study how to minimize the gap in human spaceflight and named Brian O'Connor to lead a study to investigate new models to ensure they are safe.

In the financial accounting arena, Hubbard said the Integrated Financial Management Plan (IFMP) will be provided with the resources to achieve a "clean audit."

Regarding transformation, Hubbard said Griffin did not consider it a priority to change field centers' organizational structure to become federally funded research and development centers (FFRDCs). However, Hubbard said Griffin does consider creation of a "robust space industry, including non-traditional launch services," as a priority.

Hubbard said the new administrator believes that very large projects, such

as a launch vehicle, do not lend themselves to efficient competition, while smaller space science missions can be effectively competed. Hubbard said competition will be balanced with directed funds where it doesn't make sense to have competition, but that every center should have some competition.

"Centers are not companies," Hubbard said. "Federal R&D organizations are created to do specific jobs." He said the Space Exploration Initiative RFP will be postponed indefinitely and will be handled internally by NASA. He also said that the agency's roadmapping efforts "will be brought to a reasonable conclusion," although the Science Mission Directorate does plan to use the roadmaps in formulating its science budget.

Turning to a recent success story at Ames, Hubbard noted that the center's New Business Office was selected by Kennedy Space Center to conduct some "debris field modeling" work, instead of sending the job to an outside company after being informed that Ames was fully capable of doing the job. "KSC, in the OneNASA spirit, was delighted to agree and Ames got the business," Hubbard said.

Another Ames success story mentioned by Hubbard involves development of the Ames Budgeting System (ABS) for use in compiling and calculating the center's budget submissions under full-cost accounting procedures. He said the new tool was built using foundation code and business rules from Langley Research Center and that several other field centers, including Dryden Flight Research Center, Stennis Space Center and the Glenn Research Center, have expressed interest in using the tool for their budgeting process. Hubbard said Ames has also modified and installed a fund distribution database developed at Glenn Research Center to help with its accounting system.

In conclusion, Hubbard said that 30 Ames individuals have volunteered to work at other locations outside the San Francisco Bay area and expressed appreciation for the sacrifices these employees made by working elsewhere. Many of those work details are now up for renewal and Hubbard urged Ames employees to volunteer as replacements.

During a question-and-answer session following his presentation, Hubbard responded to several questions on topics ranging from the difficulties of competing with universities for funds, to dealing with reduced budgets for the 2006 fiscal year.

Hubbard said that the agency's 2006 budget guidelines were "still in flux," and that steps were being taken to deal with the various funding issues facing the field centers.

"We're on a path to fix the problem, but we haven't solved it yet," Hubbard said, "so stay tuned."

BY MICHAEL MEWHINNEY

## KAO marks 30th anniversary of its dedication

continued from front page

Thirty years ago, the world's first major airborne astronomical research laboratory launched an ambitious journey that would take it on more than 1,400 flights through the Earth's upper atmosphere and along the way, yielded exciting discoveries that helped scientists decipher mysteries of the universe.

Dedicated on May 21, 1975, the Kuiper Airborne Observatory, often called the Kuiper or the KAO, was based at NASA Ames. Converted from a Lockheed C-141 military cargo plane, the KAO carried a 36-inch reflecting telescope capable of conducting infrared astronomy, and flew at altitudes of 41,000 to 45,000 feet, above 99 percent of the Earth's infrared-absorbing water vapor.

Named after the late astronomer Gerard P. Kuiper, the KAO has a 160-foot wingspan, measures 145 feet long and stands 39 feet high. The airborne observatory had a cruising speed of 506 miles per hour and provided a stable platform for the seven-and-a-half-hour missions. A typical flight crew consisted of two pilots and a flight engineer, in addition to the mission staff and the science team. Science teams from foreign and U.S. institutions, including

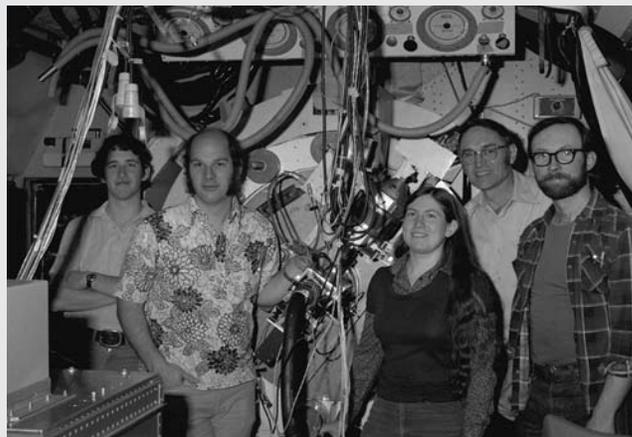
and today star formation is a major discipline in current astronomical research.

Ames' KAO team was a diverse, but extremely close-knit group of about 50 scientists, engineers, aircraft technicians, astronomers, mission planners and managers, whose common bond was their dedication to the observatory and its science mission. Flying all night and working for days or weeks at a time often from far-off destinations, they developed a camaraderie and an easy familiarity with each other that resembled that found in a family. It was a special bond that endures to this day. Seeing the KAO on the ramp still elicits pangs of nostalgia from former KAO participants.

Wendy Dolci, who spent eight-and-a-half years from 1987 to 1995 working on the Kuiper team, describes the experience as producing a "rich and colorful culture." Everyone felt like they owned it; there was a real sense of pride and ownership throughout the community of scientists and crew members who worked on the Kuiper," Dolci ventured.

Recalling a mission operating out of New Zealand back in 1986 or 1987, Gene Moniz remembered a time when the Kuiper didn't take off at 9 p.m. as scheduled. "I was at the Travelodge in Christchurch where we stayed, which was right across the street from the airport," Moniz wrote in a short summary of the incident. "I had gone out to watch the aircraft take off that evening and there were other people all around the hotel. It taxied out, but then it didn't take off. People started coming out of the hotel, because everybody in the hotel knew take-off should occur, but yet

they hadn't heard it...roar down the runway. Everybody was coming out of the hotel and heading back over to the facility. And sure enough, there had been a problem. The aircraft taxied back, and as soon as it stopped, everybody –



Dr. Fred Witteborn and the Ames science team onboard the C141 Kuiper Airborne Observatory for CAT experiment in 1980.



Onboard the C-141 Kuiper Airborne Observatory, the Jupiter Impact of Comet Shoemaker - Levy 9 flight on July 22, 1994, out of Melbourne, Australia. Onboard is Susan Stolovy (center) with the Cornell University KEGS payload, the Kuiper Echelle Grating Spectrometer.

Ames, competed for the privilege of observing from the KAO.

Over the course of its 20 years of operation from 1975 to 1995, the KAO played a major role in numerous scientific achievements, including the discovery of rings around Uranus and unexpected infrared luminosity of galaxies. Much of the science produced by the KAO concerned the birth of stars and the conditions in space that affect formation. Before the KAO, little was known about star birth. The KAO opened up the entire infrared spectrum

myself included – jumped on board. I re-did the flight plan, while the other people were doing this. We just re-did everything. It took off about a half an hour late.

Moniz recalled that a visiting engineer from Rhodesia was amazed at the group's united response to the aircraft's problem. "This gentleman was absolutely floored. He couldn't get over seeing this. He just kept saying 'How did they know?' 'How did they know?' Everybody just knew it was supposed to take off, but they didn't hear it take off, so they showed up. He just marveled that everybody worked together so well, and then jumped on – nobody was sitting around waiting for directions."

To help reduce the stress associated with the long hours of flying and the pressures of meeting any number of scientific and operational challenges, Dolci said scientists and crew sometimes wrote poetry and sang songs they had composed about the observatory. After the airborne observatory was retired, Dolci compiled a small blue booklet, "The Lonely Dark Night Sky" containing a collection of songs and poems composed by the KAO team members. The 30-page booklet was dedicated to two of the KAO team's devoted leaders, Carl Gillespie and Jim McClenahan.

Allan Meyer, who served as a staff scientist aboard the KAO for 20 years, estimates that he flew on some 800 to 900 flights, operating the airborne observatory's telescope. He attributed

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# NASA Ames celebrates Earth Day



NASA photo by Tom Trower

Earth Day booths at the Mega Bites cafe where Ames representatives answered questions about the Center's recycling and other programs.



NASA photo by Jon-Pierre Wiens



NASA photo by Jon-Pierre Wiens

Canada geese at Ames seen during the nature walks held on Earth Day.

On April 21, the Ames Environmental Services Division hosted the Earth Day event at the Mega Bites Cafe. Here one could find information about the ways in which NASA Ames is moving toward more sustainable operations.

Ames representatives were on hand to answer questions about the Center's new recycling program, onsite drinking water, its environmental management system, Ames' wildlife and much more.

Entries in the Earth Day photo contest were displayed and winners were selected by participant votes. Visit the Web at <http://q.arc.nasa.gov/qe/events/ED/ED2005/> to see the submitted photographs and winning photos.

In celebration of Earth Day 2005, Christopher Alderete, a wildlife biologist at NASA Ames, led three interpretive nature walks to showcase Ames unique wildlife, including the different avian species and the western pond turtle.



NASA photo by Jon-Pierre Wiens



Nature walks held at Ames during Earth Day.

NASA photo by Jon-Pierre Wiens

## Ames' Hanwant Singh awarded prestigious WIF fellowship

NASA Ames' senior scientist Hanwant Singh recently was elected Fellow of the World Innovation Foundation (WIF).

The goal of WIF is to develop a holistic scientific vision of the future world. Towards that end, WIF advises organizations and governments on matters of science and technology.

WIF has some 1,000 Fellows worldwide that include 75 Nobel Laureates.

Its current president is Nobel laureate Dr. Jerome Karle.

The mission of the WIF is to help bring about a new world order based on equality, a sharing environment, human dignity, self-worth and the economic co-operation of nations as one nation. WIF views this as the only way that the world can evolve peacefully in future times and where scientists and engineers are the only individuals who can physically achieve this global state. Accordingly, understanding emerging problems that face humanity is crucial to the success of the world in the future.

WIF members are increasingly involved with national and global decision making policies. Input from Fellows of the institution is sought on average of once every year.

Singh is the recipient of numerous honors and awards. He is a Fellow of the American Geophysical Union and



Hanwant Singh

an executive editor of the international journal Atmospheric Environment.

## Stanford Linear Accelerator director visits Ames

Professor Jonathan Dorfan, director of the Stanford Linear Accelerator Center, presented a director's



NASA photo by Tom Trower

Stanford Linear Accelerator Director Prof. Jonathan Dorfan spoke recently at a director's colloquium at Ames about new challenges facing particle physics.

colloquium called 'The New Universe' recently.

In his talk, he illustrated the revolutionary new challenges facing particle physics. Recent information from cosmological measurements have shown that over 95 percent of the universe is dark and that all the matter that has been so precisely studied by physicists in the post-war period represents only 5 percent of the total mass of the universe.

Dorfan concentrated on three principle questions: What is dark matter? What is dark energy? and where is the anti-matter? He also explained what is being done in high-energy physics worldwide to address these questions and also what facilities are planned for the future.

## Vernikos presents NRP lecture

Ames employees and their families, along with other members of the public, attended a free lecture in May, featuring author and former director



NASA photo by Dominic Hart

Joan Vernikos at a recent lecture at Ames, discussing space exploration, space biology research and aging-process connections. Vernikos was director of life sciences at NASA Headquarters from 1993 to 2000.

of life sciences at NASA Ames Dr. Joan Vernikos. Vernikos worked at Ames from the 1960s to the 1990s.

At this second NASA Research Park (NRP) lecture, she discussed the connection between space exploration, space biology research and the aging process. She spoke about how to live a vital, healthy life, as outlined

in her latest book 'The G-Connection: Harness Gravity and Reverse Aging.'

During her early years as a space biology researcher at NASA Ames, Vernikos noticed the connection between what happens to the body in space and the symptoms of 'normal' aging. Her pioneering work at NASA Ames focused on spaceflight analog studies, in which healthy humans underwent long periods of bed rest, a situation that mimicked the microgravity conditions in space. This breakthrough research created a deeper understanding of the hormonal and behavioral mechanisms that underlie human response to long-duration spaceflight and aging on Earth.

"The intent of the NRP lecture series is to highlight exploration, in keeping with NASA's Vision for Space Exploration," said NRP Division Chief Meighan Haider. "Stay tuned. Our topics will include everything from new technologies that support human missions to the moon and Mars, to autonomous robots and Earth analog research," she said. The lecture series' focus is on three main themes: 'explore, discover and understand.'

The NRP Exploration Lecture Series was launched in Spring 2004 and takes place three times a year.

For information about future lectures in the series, visit <http://researchpark.arc.nasa.gov>

# NASA's fifth annual Aero Expo focused on future of flight

More than 3,000 Bay Area students learned about aeronautics first-hand at the 2005 AeroExpo at NASA Ames during the four-day event held April 27 to 30. The event featured fun, educational



aeronautics presentations, hands-on activities and displays.

AeroExpo V had three venues: Career Central, an interactive presentation by aeronautics and aviation experts; Aero Village, which included hands-on exhibits and demonstrations; and NASA flight line, which featured static displays of various aircraft. Students rotated through the three venues.

Speakers included Janice Voss, NASA astronaut; Cecilia Aragon, NASA computer scientist and champion aerobatics pilot; Dennis Sullivan, FAA air traffic controller; and



NASA photos by Dominic Hart



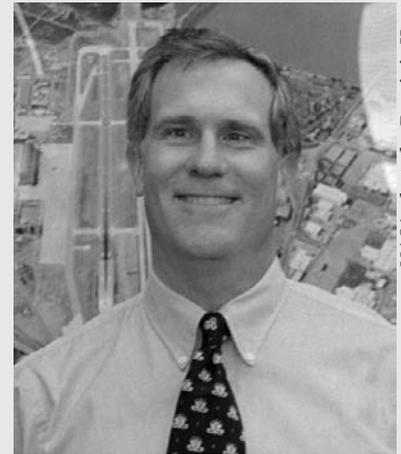
Sandra Clifford, a Bay Area corporate pilot.

"The purpose of AeroExpo is to provide students with an immersive experience in the field of aeronautics and aviation, to ignite their interest in science, technology, engineering and mathematics and excite them about careers in these fields," said Wendy Holforty, a NASA research engineer and AeroExpo project manager.

For additional information about AeroExpo V, visit <http://quest.arc.nasa.gov/projects/aeroexpo/>

BY JONAS DINO

## Roellig receives OneNASA Award



NASA photo by Dominic Hart

Tom Roellig

Recently, Tom Roellig of the Ames Astrophysics Branch was recognized with a OneNASA Peer Award for his work on the Spitzer Space Telescope and for his dedication to the success of the mission, which spanned across Ames, JPL, GSFC and the contracting organization.

The OneNASA center-best Peer Award recognizes individuals and teams of NASA contractors and/or civil servants who go above and beyond the call of duty to build a OneNASA culture throughout the agency.

Roellig contributed important knowledge and expertise in his role on the project and his actions and technical judgments were always aimed at the overall success of the mission.

## Former Ames director addresses Ames employees

In April, Dr. Bill Ballhaus presented a director's colloquium in the main auditorium entitled 'The Ten Most Important Lessons You Didn't Learn in Engineering School.'

His talk, which included two videos, was both understandable and relevant to the culture changes that were recommended for the agency by the Columbia Accident Investigation Board (CAIB).

Ballhaus is now the president and CEO of the Aerospace Corporation, an organization widely known as the 'architect of national-security space.' Aerospace has had a hand in every government launch vehicle and satellite program since 1960, and is heavily involved in helping transform every sector of military space with next-generation systems.

Prior to joining Aerospace in 2000,

he had an 11-year career with Lockheed Martin Corporation. At Lockheed Martin, Ballhaus served as corporate officer and vice president of engineering and technology. Prior to the merger with Lockheed, Ballhaus served as president of two Martin Marietta businesses, Aero and Naval Systems and Civil Space and Communications. He also was vice president and program director of Titan IV Centaur operations at Martin Marietta Space Launch Systems.

Ballhaus began his career at NASA Ames as a research scientist in 1971 and rose to become director of Ames from 1984 to 1989. He also served as acting associate administrator for aeronautics and space technology at NASA Headquarters in Washington, D.C. (1988-1989). Ballhaus has been elected an honorary fellow of AIAA.



NASA photo by Tom Trower

William Ballhaus, former Ames center director, during a recent Director's Colloquium.

## Veteran Korean War Squadron 51 pilots visit Ames

Veterans of U.S. Navy Fighter Squadron 51 (VF-51) from the Korean War toured NASA Ames recently.

Before being disestablished in 1995, VF-51, known as 'The Screaming Eagles,' was the oldest fighter squadron in continuous service in the Pacific fleet. The Screaming Eagles, sailing aboard the U.S.S. Essex, were the first operational Navy squadron to fly jets aboard an

ward served two tours at Moffett Field, one as a flight instructor and the second as a squadron officer.

On the tour, the former fighter pilots saw the latest in Ames-developed technologies, their first stop, naturally, being the Aviation Systems Division. Here, Heinz Erzberger, senior scientist, Aviation Systems Division, detailed the Ames-developed Center-TRACON Au-

models of air traffic over the entire United States during a 24-hour period. Erzberger's demonstration concluded with CTAS's User-Preferred Routing/Descent Advisor conflict probe, a computer algorithm that estimates conflicting air traffic and helps air traffic controllers plan the most efficient route around it.

After seeing the Ames-developed air traffic control technologies, one of the VF-51 pilots remarked "It sure makes you feel a lot safer when you're flying."

At the Vertical Motion Simulator (VMS), Hayward was given the opportunity to fly the space shuttle. The VMS is the world's largest amplitude simulator, having a 60-foot vertical and 40-foot lateral range of motion. Using interchangeable cabs, the VMS can also be configured to simulate blimps, helicopters, the latest in jet fighters, as well as large multi-engine aircraft such as the C-17. On Hayward's flight, he landed the space shuttle orbiter twice, right down the runway centerline. Thomas Alderete, assistant division chief, Simulation Facilities, remarked that Hayward's landings were "excellent."

The group concluded its tour with a stop at FutureFlight Central (FFC), hosted by Nancy Dorighi, FFC manager. FFC is a two-story, 360-degree full-scale simulation facility, customizable to model any airport in the world in 3-D. Most recently, FFC has been used to showcase 360-degree 3D images taken by the Mars rovers Spirit and Opportunity.

BY NICK VERONICO



NASA photo by Tom Trower

Veterans of U.S. Navy Fighter Squadron 51 (VF-51) from the Korean War visit FutureFlight Central during a recent visit and tour of Ames.

aircraft carrier as well as the first to fly jet aircraft in combat.

On July 3, 1950, a VF-51 F9F-2 Panther claimed its first aerial victory over a Soviet-built Yak-9 in Korea. VF-51's Korean-era alumni include such luminaries as astronaut Neil Armstrong; Medal of Honor recipient Admiral James B. Stockdale; and retired Admiral Tom Hayward, who served as chief of naval operations from July 1978 to June 1982.

Early in his career, Admiral Hay-

ward served two tours at Moffett Field, one as a flight instructor and the second as a squadron officer. On the tour, the former fighter pilots saw the latest in Ames-developed technologies, their first stop, naturally, being the Aviation Systems Division. Here, Heinz Erzberger, senior scientist, Aviation Systems Division, detailed the Ames-developed Center-TRACON Au-

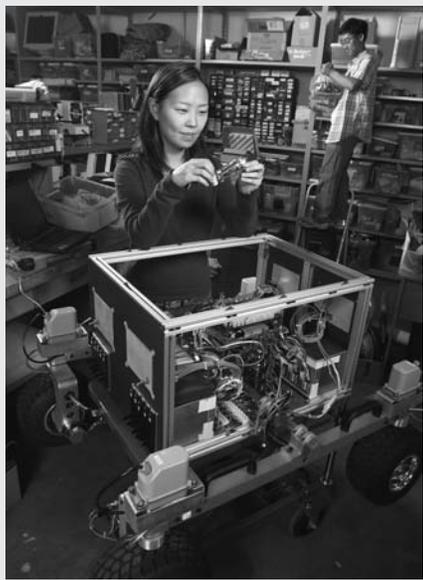
tomation System (CTAS) and its component tools. The ex-Navy fliers spent a great deal of time viewing the Traffic Management Advisor's Final Approach Spacing Tool.

Live air traffic radar data was fed to Ames, updated every 12 seconds, showing airliners on approach to and departing Dallas/Fort Worth's air traffic control center. In addition, the Future Air Traffic Management Concepts Evaluation Tool (FACET) showed computer

## NASA developing robots with human traits

Will robots that help astronauts in space be as friendly and likeable as the fictional 'R2-D2' android portrayed in the original 'Stars Wars' motion picture?

NASA scientists say robots will behave more like human beings in the



NASA photo by Dominic Hart

Lead hardware engineer Susan Young Lee and computer scientist Eric Park working on the NASA K-10 rover.

future, even if – like R2-D2 – these machines do not look like people.

NASA researchers envision futuristic robots that 'act' like people, enabling these mechanical helpers to work more efficiently with astronauts. Human-robot cooperation, in turn, will enable exploration of the moon and Mars, and even large-scale construction in extra-terrestrial places, according to scientists. Because human crews will be limited to small teams, astronauts will need robot 'helpers' to do much of each team's work, scientists reason.

"Our goal is not for robots to have the same 'thought process' as humans, but rather for them to act, respond and interact more 'naturally' in ways that humans do with other humans. This requires that robots possess traits such as self-awareness (recognition of their limits and when they need to ask for help), and human-awareness (knowing to whom they are talking, and when it is an appropriate time to ask a question)," said Illah Nourbakhsh, a scientist who leads a group developing human-robot teams at NASA Ames.

Though remotely controlled machines and robots that work entirely on their own are valid goals, the NASA-Ames team plans to focus on robots that are partly controlled by people and operate independently the rest of the time, Nourbakhsh said.

There are three main areas that

Nourbakhsh's team will develop. One is called 'collaborative control,' during which the human being and the robot will speak to one another and work as partners. "A key benefit of collaborative control is that the robot is able to ask questions of the human in order to compensate for (the robot's) limitations," Nourbakhsh explained.

A second area that NASA Ames researchers will develop is to build robots that have reasoning mechanisms that work similarly to human reasoning. "Of primary interest is making the human and robot understandable to each other," Nourbakhsh said.

Thirdly, the researchers will conduct field tests of people and robots working together. Many experiments also will occur in a special, indoor laboratory under construction at Ames, featuring a control room with a window looking out on robots working in a large area that will simulate the surface of a moon or planet. The control room will imitate a human habitat on the moon or Mars. Scientists are targeting completion of the robot laboratory for the fall of 2005.

The robots will help assemble buildings, test equipment, weld structures and dig with small tools. Human-robot teams will use a checklist and a plan to guide their joint efforts, according to NASA Ames scientist Terrence Fong. Human beings and robots will use "partner-to-partner" interaction to share information and to support one another. "It is the way human construction and maintenance crews frequently operate," Fong explained.

"We will perform detailed workflow and critical incident analysis to understand the impact of partner-to-partner, human-robot interaction on tasks, to identify failure modes and learn how to improve execution," said Nourbakhsh. "We will place significant emphasis on assessing system performance, human performance and robot performance," he added.

The group's robot development work will focus on specific tasks essential for basic exploration mission operations including: shelter and work hangar construction, piping assembly and inspection, pressure vessel construction, habitat inspection and resource collection and transport. "Each of these operational tasks demands effective human-robot teamwork and requires extensive interaction between human and robot," Fong observed.

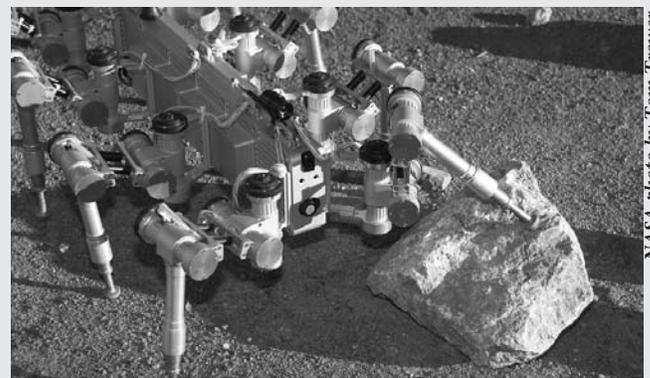
Scientists say human-robot coop-

eration will result in a better outcome than human- or robot-only teams could accomplish.

To make human-machine teaming a reality, a NASA multi-pronged effort is underway to develop robot intelligence. Similar to human thinking, it's designed to improve the mechanical workings of robots and to standardize human-robot communications.

"We believe that by building robots with reasoning mechanisms and representations that are similar to what humans use, we can make human-robot interaction more natural and human-like," said Nourbakhsh.

"These teams will include humans and robots working in close quarters as well as humans controlling and interacting with robots over medium dis-



NASA's 'scorpion rover' in the Ames Mars pit.

NASA photo by Tom Trower

tances and from ground control," Nourbakhsh predicted. "The effectiveness of human-robot interaction will have a major impact on productivity, cost and risk reduction in exploration missions," he explained.

"Conventional human-robot dialogue is limited to 'master-slave' commanding and monitoring," Fong said, speaking of how robots generally have been controlled to date. "As a result, system performance is strictly bound to the operator's skill and the quality of the (computer) user interface."

In contrast, partner-to-partner operation reduces the need for fine-grained planning and resource scheduling, according to Fong. Another advantage of partner-to-partner operation is that it "does not require the human to continuously engage in robot teleoperation or supervision," Fong said. "To improve system capability, increase flexibility and create synergy, human-robot dialogue needs to be richer and work both ways."

The system under development at NASA Ames will enable robots to interactively support one another so that they "can quickly jump in and help the other (human or robot) resolve issues as they arise," Fong continued. NASA Ames researchers will initially focus on developing robots that will operate more like

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# NASA developing robots with human traits

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human beings during construction and maintenance tasks.

Robots have worked as field geologists during previous field tests, but in the future, these human-like machines



NASA photo by Tom Trower

The NASA 'snakebot rover' maneuvers around rocks in the Mars pit at Ames.

will also do non-scientific work. They will not only look for raw materials on planets, but also process those materials, according to researchers. Other robot jobs may include scouting, surveying, carrying equipment, inspecting and maintaining machines and habitats. Androids could well serve as field medics, monitoring, helping and transporting injured astronauts.

Human-robot teams must be reliable, survivable, reusable and low-cost, according to scientists, who hope to enable robots to receive general commands, such as, "inspect habitat." The human-like machines would then autonomously perform tasks and seek help only when they encounter problems they cannot solve by themselves.

"A challenge that scientists face is enabling robots to perform tasks on their own as much as possible, and giving these androids the ability to ask for human help and knowledge only when necessary," observed Fong.

Even so, robots will need to understand specific instructions in the same way that human beings often communicate them – in "spatial terms," according to scientists. "We (will) focus on spatial reasoning, so that humans and robots can converse more like humans do with each other, such as, 'move that panel to my left,'" Fong explained.

Two robot characteristics are that these machines will communicate by speaking and gesturing. In places with

little or no atmosphere, sound cannot travel well, and without radio communications, a gesture might be the most practical way for a robot and a human being to communicate, according to researchers. Trying to communicate in a very noisy area is another obvious reason to enable robots and humans to use gesturing to 'talk.'

"Because spacesuits are restrictive, they don't allow the astronaut to use devices such as small computers. Therefore, we are investigating the possibility of using pointing gestures to communicate with robots," Fong said.

Robots and human beings need to clearly converse about goals, abilities, plans and achievements, according to Fong. People and robots need to "col-

laborate to solve problems, especially when situations exceed (robot) autonomous capabilities," Fong explained.

According to Fong, human-robot communications need to take place on three levels: in a shared space, line-of-site (from a human being in a habitat to a robot outside on the planetary surface), over the horizon and even at interplanetary distances. To date, probably no one single robot system is capable of communicating on all these levels, Fong added.

Fong said that a robot that could work autonomously would enable astronauts to "focus on the task, instead of robot control and monitoring."

BY JOHN BLUCK

## KAO marks its 30th anniversary dedication

*continued from page 3*

much of the airborne observatory's success to the charismatic leadership of McClenahan, who died in 2000. Often described as the "driving force" that enabled the observatory to "get the data" for astronomers worldwide, Meyer said McClenahan was a truly unique individual.

"He was from up north somewhere in the mountains and had a sense of humor like Will Rogers," Meyer said. "He had a sense of charisma and could meld together all kinds of people -- military crew members, scientists, engineers, computer programmers and administrators -- and somehow, he was able to get them all to work together."

Under McClenahan's leadership, the KAO completed a total of 1,417 flights, many of them from Ames, but others from New Zealand, Australia, Samoa, Panama, Japan, Guam, Brazil, Ecuador, Chile, Houston and Hawaii.

While many of the KAO's flights were memorable for the scientific discoveries they made, some of them are remembered for other reasons. Sometimes the aircraft had mechanical problems; other times the telescope or scientific instruments malfunctioned.

Ed Erickson, a scientist on the KAO for 20 years, recalls a flight in 1978 that took off from American Samoa when two of the observatory's four engines failed soon after takeoff. "The aircraft staggered and instrument power was shut down, but the mission crew and scientists didn't know immediately what was going on. Soon we banked, and the flight engineer came back to crank down the landing gear manually," Erickson said.

"That was a pretty exciting adventure," he added. "Everybody was worried, but we had a good crew and we got back okay."

On another mission flying at 41,000 feet over Hawaii, Erickson said the air-

craft encountered a dense layer of clouds, a very rare occurrence at that high altitude, that made it impossible to see stars, much less to conduct astronomical observations.

But mostly KAO veterans remember the amazing scientific discoveries made on the KAO by scientists from all over the U.S. and abroad. Meyer vividly recalls the 1977 flight from Perth, Australia and flying over the Indian Ocean when the nine thin rings of Uranus were discovered.

During the course of its two decades of conducting aerial observations, KAO astronomers also probed the planets to discover water in Jupiter's thick atmosphere and self-luminosities of Jupiter, Saturn and Pluto. Scientists also uncovered embryonic stars hidden inside dense dust clouds, made the first detection of a natural interstellar infrared laser, and found evidence of a massive black hole at the center of the Milky Way.

But in addition to all the science that it conducted, what most people who worked on the Kuiper Airborne Observatory remember is the experience they had working as a team with a group of talented, dedicated people, under good leadership, doing what they liked to do.

"It's nice to be doing what you're interested in," said Meyer, whose job on the KAO was to point its telescope at the night sky. "Scientists will put up with whatever inconveniences or hassles they may encounter in order to do their science," Meyer said. "It was a great experience to be part of the team and one I won't ever forget."

The KAO was decommissioned in the fall of 1995 to make way for the Stratospheric Observatory for Infrared Astronomy (SOFIA) now in development under Ames management.

BY MICHAEL MEWHINNEY

## NASA Administrator Michael Griffin visits Ames

*continued from front page*

money if they do not know how to apply and understand relevant technologies



NASA photo by Dominic Hart

NASA Administrator Michael Griffin answers questions from the audience at the May 23 town hall meeting at Ames.

and science. "We're talking about being on the moon in the next decade and on Mars in 25 years," he continued. "In that time companies merge -- go out of business."

"Some of what we do must stay here so we can do it in house," he said to spontaneous applause from the audience.

Another employee asked Griffin how familiar he is with Ames' work and capabilities. "I'm fairly familiar with Ames' portfolio," he replied. "I'm here to implement" the (president's and the Congress' policy), Griffin added, noting there would be less wind tunnel work and most likely more thermal protection work at the Center.

He said that he saw interesting cellular biology work at Ames and "some stuff on extraterrestrial core drilling" during his tour of Ames. Griffin said that the Center should look at "the stuff Ames needs to do for exploration" and concentrate on those areas.

Asked about how NASA should utilize employees who traditionally have worked in the wind tunnels, Griffin spoke about how times change, and how people also need to change with the times. He related how he had been out of a job on two occasions. "I know what it is like," he remembered. "It isn't fun, so I'm not minimizing it." He added that NASA management is studying how

the agency handled the transition from the Apollo missions using Saturn rockets to flight on the space shuttle. "We are going to try very hard to transition our people," he stated.

"If we move on, we do new things," he explained. "We can't hold still. In fact ... the obligation of a research center is to know when to let go of the past."

A question about full-cost accounting followed. "In our science enterprise, we compete for these dollars with colleagues in universities ... We have full cost accounting."

"Certainly I can level the playing field," Griffin retorted. He said that the cost of facilities "should be removed" from the equation, and keeping a facility open or closing it "should be decided at the national level."

The next question focused on system engineering and on Griffin's prior comments "that system engineering should go back in house."

"The system engineering and architecture must be in house," Griffin said. "What would be the role of the different centers, I don't know," he added. "Typically, the large missions would have system engineering," he said, adding that one might hand off thermal protection to a research center, and Ames possibly would be the place to do thermal protection work.

Another employee shared a comment rather than a question. "I want to make you aware of something that is good.... I've been here 23 years ... the situation has changed dramatically over the last few weeks.... morale has gone from the worst to the best." The audience applauded loudly at these comments.

Addressing another query about full-cost accounting, Griffin said, "I'm going to try not to sacrifice people on the altar of full cost accounting." But he added, "Full-cost accounting is not the villain," because "It tells you what it really costs (to conduct an activity)."

"It costs me a certain amount to keep an arcjet open," he said. "I need to know what it costs (so I can) ask Congress for money," he explained. "First of all, I should not put that overhead on the back of some researcher," Griffin continued. "I've already decided I want to keep it open."

He further explained, "I don't want to charge as a business would because I

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## Silver Snoopy awarded to John Hines



NASA photo by Dominic Hart

Astronaut Dr. Scott E. Parazynski, left, John Hines, center, and Mrs. Laura McArthur-Hines.

John Hines, a physical scientist in the Fundamental Space Biology Research Integration Office at NASA Ames, was presented the Silver Snoopy award by astronaut Dr. Scott E. Parazynski recently.

Hines was recognized for his outstanding support to space programs in

his position as an inspiring leader and mentor to generations of technologists from NASA, Stanford and several other institutions.

With a sharp focus on applied, realistic technology products and a daily connection to NASA's exploration missions, he has developed a wide variety of systems for flight and terrestrial use and has encouraged and supported their use in civilian medicine with great success.

An astronaut always presents the Silver Snoopy because it is the astronauts' own award for outstanding performance, contributing to flight safety and mission success. It is a special honor to receive this award. Fewer than 1 percent of the space program workforce receives it annually.

## Former Ames scientist David Feller passes on

David Feller, a biochemical researcher, passed away on April 6 in Palo Alto at the age of 82. Feller was born July 25, 1922, in San Francisco and moved to Santa Monica as a teenager, later graduating from UCLA. He worked for Shell Development Company in Emeryville, later joining the Navy to train as an aviation electronic technician.

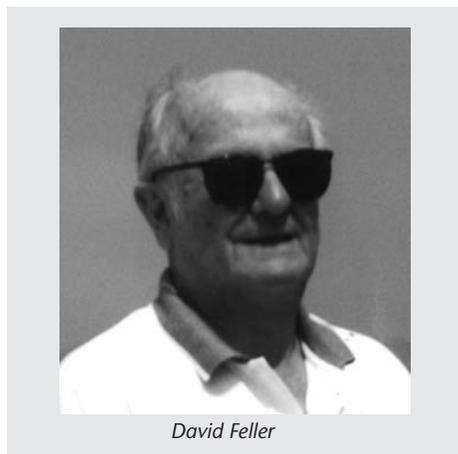
After World War II, he earned graduate degrees in physiology and biochemistry at UC Berkeley and moved to Palo Alto in 1962. Feller held university positions at Tufts University School of Medicine, the University of Washington School of Medicine and Stanford University. He entered federal civil service at the Veteran's Administration Hospital in Seattle and then worked at

NASA Ames for 23 years, retiring here in 1985.

Feller published more than 90 scientific papers in the fields of intermediary metabolism, thyroid physiology, glucose metabolism in diabetes and the effects of artificial gravity on body metabolism.

His hobbies included photography, videography, fishing, sports, woodcarving, walking and computer technology. He coached little league baseball and was the president of the Palo Alto Babe Ruth League and the Mountain View Senior Center Woodcarver's Club.

Feller is survived by his wife of 58 years, Bernice; his children, Barbi, Rich and Steve; and six grandchildren.



David Feller

## ACCC 10th Annual Charity Golf tournament scheduled

This year's Ames Childcare Center's charity tournament format will be a four-person scramble (best shot from your team used for each stroke). Prizes will be awarded to the teams with the lowest three net scores and the lowest gross score.

**Date:** Friday, June 17

**Place:** Moffett Field Golf Course

**Time:** 12:00 p.m. - Registration  
1:00 p.m. - Shotgun start  
5:00 p.m. - Hors d'Oeuvres  
and post-tournament  
raffle

The registration fee is \$70 per person. Teams of four is \$280 (registrations are due by June 10). The fee includes the round of golf, lunch before the tournament and one raffle ticket per player.



Registration forms can be downloaded from the ACCC Web site at <http://acc.arc.nasa.gov>. Sponsorship information is also available on the Web site. Current sponsors include Golden Bay Federal Credit Union, Aerospace Corporation Inc., and Systems Electric.

The proceeds from this tournament will be used to complete the playgrounds at the new ACCC facility, which the

ACCC anticipate to occupy by the time of the tournament.

Visit the Web site, or contact [childcare@mail.arc.nasa.gov](mailto:childcare@mail.arc.nasa.gov) for more information about the tournament, or about the ACCC, an NAEYC-accredited child care and preschool serving the NASA Ames civil service and contractor employees.

## Electronic employee checkout has arrived!

The day long awaited by exiting employees and all those who must sign the employee checkout form has arrived. Thanks to a collaboration between Protective Services (Code JP), Applied Information and Technology Division (Code JT) and Application Development and Services (Code JTA), the employee checkout process has gone electronic.

No longer will employees need to spend days trudging to various offices to get the signatures required for checkout. No longer will the form signers need to stop and sign a form because someone has just appeared in the office doorway.

As of May 11, 2005 the electronic employee checkout form became accessible on the 'Inside Ames' Web page located at <http://insideames.arc.nasa.gov/>) and the Protective Services Employee badging Web page at [http://jp.arc.nasa.gov/SM/emp\\_badging.html#checkout](http://jp.arc.nasa.gov/SM/emp_badging.html#checkout).

The new process is handled primarily through the use of the e-mail system. The employee, supervisor or administrative staff member can generate

the checkout record. Once the record is generated, e-mails are sent to each checkout station alerting them of the impending checkout. Each station has the option of clearing the employee or replying to the employee with instructions regarding actions required prior to clearing.

In some cases, the employee may still need to visit a station in person in order to be cleared. Once each station has cleared the employee, the employee can then proceed to the Employee Badging Office to turn in his/her badge and sign the completed checkout form.

Hopefully, this new electronic procedure will facilitate the checkout process for both the employee and the checkout stations and allow all involved to minimize the time spent completing the process.

Any questions regarding the new procedure should be directed to Mary Williams at her e-mail at [Mary.P.Williams@nasa.gov](mailto:Mary.P.Williams@nasa.gov) or contact Donna Cetera at [dcetera@mail.arc.nasa.gov](mailto:dcetera@mail.arc.nasa.gov).

# NASA Administrator Michael Griffin visits Ames

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want to keep it open." According to Griffin, he would charge less for its use. "Full cost accounting is not an excuse for a bad decision," Griffin said. People clapped vigorously following that comment.

Marc Cohen, Ames Federal Employees Union (AFEU) officer, asked Griffin about the "twists and turns" of the "development of the Exploration Program" and civil service salary impact. "You're not competing for your salary," Griffin replied. "I'm turning that all off."

He added that "because we don't have a good ablative (heat shield) technology" in the United States, NASA will probably have to develop it "right here at Ames."

According to Griffin, he would like to restore some space mission capability to Ames. "The last was Lunar Prospector," he noted. "If some things at Ames have gone away -- I have two things to do... I find some other things to do, or shut it down." He avowed, "We're not going to shut it down."

Steve Hipskind, acting director of the Earth Science Division, asked about NASA's role in Earth science. Griffin observed that the "astronomy community" has worked out priorities and secured expert support for those priorities, adding that the Earth science community should do the same. "My challenge to Earth science is get on the ball," Griffin said.

One employee expressed concern "about the first A in NASA."

"Right now, aeronautics enjoys less priority than it once did," Griffin said. "I know you don't want to hear it, but that's how I see it."

Griffin received loud and sustained applause at the end of the question-and-answer session.

Prior to addressing Ames employees at the town hall meeting, Griffin met with Bay Area news media in the Exploration Center, where he fielded questions from reporters from KGO-TV (ABC), KNTV-TV (NBC), KGO-news radio (ABC), the San Francisco Chronicle, the San Jose Mercury News, the Palo Alto Daily News, Wired magazine, the Mountain View Voice, the Ming Pao Daily News and Zuma Press.

Accompanied by Hubbard, Griffin told the news media that there were no plans to close NASA Ames and that the Center has a bright future ahead of it, although some programs, such as aero-

nautics, would be scaled back in accordance with the nation's Vision for Space Exploration. While returning the space shuttle to flight remains the top priority for the agency, Griffin vowed to support science programs, such as the astrobiology research being conducted at Ames, and said that Ames will continue to play a key role in implementing the Vision for Space Exploration.

Griffin was sworn in as NASA's 11th administrator on April 14, 2005. He was nominated by President George W. Bush on March 14, 2005, and confirmed by the U.S. Senate April 13.

Griffin previously served as NASA's chief engineer and associate administrator for exploration at NASA Headquarters. He also worked at NASA's Jet Propulsion Laboratory in Pasadena, Calif.

Prior to his appointment as administrator, Griffin was serving as space

department head at Johns Hopkins University Applied Physics Laboratory. Before that, he was president and chief operating officer of In-Q-Tel, Inc., and has held several positions within Orbital Sciences Corporation, including chief executive officer of Magellan Systems Inc.

Griffin earned a bachelor's degree in physics from Johns Hopkins; a master's degree in aerospace science from Catholic University of America; a doctorate in aerospace engineering from the University of Maryland; a master's degree in electrical engineering from the University of Southern California; a master's degree in applied physics from Johns Hopkins; a master's degree in business administration from Loyola College; and a master's degree in civil engineering from George Washington University.

BY JOHN BLUCK

## NASA Communication Materials Review (CMR) System established

Do you produce materials intended to communicate to the public and/or your colleagues about the great programs and projects you are

that was established to implement unifying elements in all NASA-funded communication materials?

Learn more about the CMR and its requirements by visiting the internet at: <http://communications.nasa.gov>.

For your convenience, a link to the CMR can also be found on the Online Tools section of Inside Ames Web site.

If you have questions about the CMR, or need any assistance using the system, contact

Laura Lewis at ext. 4-2162.

The screenshot shows the NASA Communications Review System (CMR) website. At the top left is the NASA logo and the text "NASA COMMUNICATIONS REVIEW SYSTEM". To the right are links for "Technical Issues & Questions" and "Submit Comment". Below this is a navigation bar with "Home" and "Submit a Communication" (with a plus sign). A search bar labeled "SEARCH COMMUNICATIONS" is also present. The main content area is titled "WELCOME TO NASA - COMMUNICATIONS REVIEW SYSTEM" and "Welcome to the Communications Materials Review (CMR) System". It contains several paragraphs of text explaining the CMR process, its goals, and how to use the system. There is a "LOG IN" section with "Username:" and "Password:" fields and a "SIGN IN" button. Below that is a "NOT REGISTERED YET?" section with a brief description of the system's availability. At the bottom, there is a section titled "What does not need to be submitted at this time:" with a bullet point: "Press releases and NTV video files".

working on here at Ames? If so, are you aware of the NASA Communication Material Review (CMR) process

# NASA Astrobiology Institute holds 2005 biennial meeting

Nearly 500 people attended the NASA Astrobiology Institute (NAI) fourth biennial meeting in Boulder, Colo., in April.



NASA Astrobiology Institute Director Bruce Runnegar (right) presented the Gerald Soffen award for best student poster to Abhishek Tripathi from UCLA.

Hosted by the University of Colorado, the meeting's twin objectives were to learn about the latest science being accomplished by NAI members and to encourage contacts between individuals and teams that will pay off in future collaborations. At the conference banquet, NASA Ames Center Director G. Scott Hubbard said that this meeting made him feel that astrobiology had come of age.

The NAI is headquartered at Ames, and both NAI Director Bruce Runnegar and Deputy Director Rose Grymes report to Hubbard. Ames was selected to operate the NASA Astrobiology Institute for NASA because of its unique core competency in astrobiology, the study of life in the universe. In addition to the management responsibility for NAI, Ames also has one off the 16 competitively selected member teams, with David DesMarais as the principal investigator.

Since astrobiology is a highly interdisciplinary field, meetings like this provide an ideal opportunity to learn about research in multiple disciplines. Unlike most science meetings today, NAI 2005 had no multiple or parallel sessions. This structure encouraged everyone to attend every session, not just those closely related to her or his specialty. One outstanding attribute of this meeting was the large number of young scientists attending.

Organizers and speakers at this conference recognized the special challenge of presenting their work in a way that would be comprehensible to scientists from other disciplines. 'Jargon control'

is one way to enhance cross-discipline communications. For example, many attendees came away conscious of the three separate meanings of the common words "radiation" and "terrestrial" – meanings that depend on the discipline under discussion.

Cross-discipline communication was also encouraged by providing "primer talks" the day before the meeting to explain some of the basics for scientists in other fields. Nick Woolf (University of Arizona) presented the primer on astronomy, Chris House (Penn State) and David Kring (University of Arizona) talked about geology, and Ames' Lynn Rothschild and Max Bernstein covered the fundamentals of biology.

The scientific meeting itself – both the 50 oral presentations and more than 250 posters – was organized according to scientific themes, as described below. In a departure from earlier meetings, the papers on education and public outreach were not placed in a separate session but were distributed throughout the program. Abstracts of all the papers and posters were published in the journal *Astrobiology* (Volume 5, No. 2, April 2005), which was distributed to all attendees.

The first theme of the meeting was the formation and evolution of planetary systems, which is also the initial step in creating worlds suitable for life. The lead invited talk on the formation and evolution of habitable worlds was given in two parts, by Steve Mojzsis (Colorado University) and Michael Meyer (University of Arizona). The lead presentations served both to introduce the topic and to place the following shorter papers in context.

Theme 2 on extrasolar planets was introduced by Norm Sleep (Stanford University) and Jim Kasting (Penn State), who asked how common are habitable planets in the galaxy – connecting biochemistry, astrophysics and geophysics. Many papers in this session dealt with the biosignatures that might be useful when we develop the capability to observe the spectra of rocky planets around solar-type stars.

Theme 3 dealt with the origins of life (note the plural, since we assume life has begun many times). In his introduction to the topic, Norm Pace (Colorado University) discussed how genetic studies have greatly advanced our understanding of evolutionary relationships, and this theme was echoed in several other papers.

Future technologies, exploration, and societal issues associated with astrobiology were the topic of session 4. Dan Werthimer (University of Califor-

nia at Berkeley) led off with a wide-ranging talk about SETI, the Fermi Paradox (Why aren't they here?) and the future of our civilization. This session contained the greatest variety, with topics ranging from entropy to "astrobiology and the sacred."

Topic 5 was the evolution of life.



An unusual spring snow storm provided beautiful views of Boulder, but disrupted arrivals at the NAI 2005 meeting.

Steve D'Hondt (University of Rhode Island) spoke on how life interacts with its environment, while most of the contributed papers in this session focused on geochemical exploration of the past history of Earth, its atmosphere, and its oceans to investigate the changing interactions between microbial life and the environment.

Tracing life was the theme of session 6. Marilyn Fogel (Carnegie Institution) began with a discussion on distinguishing true biology from non-biological look-alikes, followed by several papers about the search for microbial fossils from early Earth. This work to identify specific fossils complements the geochemical and biochemical studies reported in the previous session.

The final theme was evolution in the solar system, introduced by Mitch Sogin (Marine Biological Lab). Papers in this session included the study of analog habitats on Earth, as well as discussion of the significance as a possible biosignature of the methane recently discovered in the martian atmosphere.

Other events in this fast-paced meeting included four public lectures, a banquet featuring remarks by Hubbard and by Carl Pilcher of NASA Headquarters, daily press briefings, a special paper by Jonathan Lunine (University of Arizona) on the latest news from Titan, smaller group meetings of several NAI focus groups and working groups on education and communications, and two get-togethers by the graduate students and postdoctoral fellows at the conference. For many attendees, the scientific high-

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## Events Calendar

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

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

**Ames Bowling League**, Palo Alto Bowl on Tuesday nights. Seeking full-time bowlers and substitutes. Questions to sign up: Mike Liu at ext. 4-1132.

**Ames Child Care Center Board of Directors Mtg**, every other Thursday (check Web site for meeting dates: <http://acc.arc.nasa.gov>), 12 noon to 1:30 p.m., N-210, Rm. 205. POC: Cheryl Quinn, ext. 4-5793.

**Ames Contractor Council Mtg**, first Wednesday each month, 11 a.m., N-200, Comm. Rm. POC: Linda McCahon, ext. 4-1891.

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

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

**Ames Mac Support Group Mtg**, third Tuesday of each month, 11:30 a.m. to 1 p.m., Bldg. N262, Rm 180. POC: Julie ext. 4-4694 or Tony ext. 4-0340.

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

**Ames Sailing Club Mtg**, second Thursday of each month (Feb through Nov), from 11.30 a.m. -1 p.m. in the special events room in the Ames Visitor Center in N-223. All are welcome. POC: Jeff Smith, ext. 4-2586.

**Environmental, Health and Safety Information Forum**, first Thursday of each month, 8:30 a.m. to 9:30 a.m., Bldg. 221/Rm 155. URL: <http://q.arc.nasa.gov/qe/events/EHseries/> POC: Stacy St. Louis at ext. 4-6810.

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

**Jetstream Toastmasters**, Mondays, 12 p.m. to 1 p.m., N-269/Rm.179. POC: Becky Brondos at ext. 4-1959, bbrondos@mail.arc.nasa.gov or Bob Hilton at ext. 4-1500, bhilton@mail.arc.nasa.gov.

**Nat'l Association of Retired Federal Employees, (NARFE)**. Former and current federal employees. Your only contact with Congress. Join to protect your federal retirement. Chptr #50 will then meet on the first Fri. of each month at HomeTown Buffet, 2670 El Camino (at Kiely), S. Clara, 11 a.m. lunch. POC Earl Keener (408) 241-4459 or NARFE 1-800-627-3394.

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

## Environmental, Health and Safety Forum set

**Topic:** 'If Sustainability is the goal, how do we get there?: Generating specific environmental improvements for your work and life.'

**Presenter:** John Scarbaro, Environmental Management Systems Coordinator, SAIC

**Date:** June 2, 2005  
**Place:** Building 221, Room 155  
**Time:** 8:30 a.m. to 9:30 a.m.

## Nano Tech 2005 conference set

*continued from front page*

This year's NASA Tech Briefs Nanotechnology 2005 conference is

**Date:** June 7 to 8  
**Location:** Westin Hotel, Santa Clara  
**Required application:** ARC Form 301  
**Coordinator:** Mark Sutherlund, ext. 4-5617, MailStop 241-3  
**Cost:** \$250 (special rate for NASA Ames)  
**Course code:** None  
**www.techbriefs.com/nano**

sponsored by the NASA Ames Technology Partnerships Division.

Keynote speakers will include: Matthew Nordan, Lux Research; Banny Banerjee and Craig Lawrence, IDEO; and Paul Saffo, Institute of the Future.

Industry representatives from Applied Materials, IBM, Agilent, JP Morgan and NanoStellar will present at this event and more exciting speakers are being added each day.

This is an ideal venue to discover and discuss potential R&D partnerships.

Register for the conference by contacting Mark Sutherlund to qualify for the special rate.

## Ask the 'export expert'

### Question:

Is e-mail an export?

### Answer:

It certainly can be. E-mail is a method of transferring information. Simplistically put, if that information is export controlled (or has not been approved for public release and the recipient is a foreign entity), then the e-mail is an export. Beware.

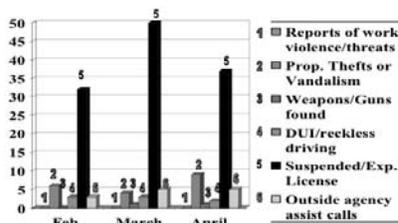
Do you have a question for the export expert? Send it care of [kwall@mail.arc.nasa.gov](mailto:kwall@mail.arc.nasa.gov). And, visit the Web at <http://jp.arc.nasa.gov/EC/EC.html>.

## Protective Services monthly activity

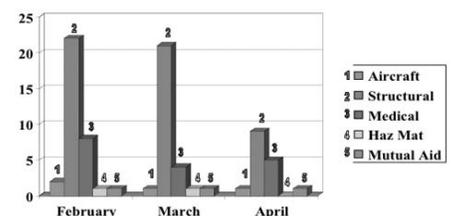
A statistical summary of activities of the Protective Services Division's Security/Law Enforcement and Fire

Protection Services units for the month of April 2005 is shown below.

Security/Law Enforcement Activity



Fire Protection Activity



## Ames Classifieds

Ads for the next issue should be sent to [astrogram@mail.arc.nasa.gov](mailto:astrogram@mail.arc.nasa.gov) and must be resubmitted for each issue. Ads must involve personal needs or items; (no commercial/third-party ads) and will run on a space-available basis only. First-time ads are given priority. Ads must include home phone numbers; Ames extensions and email addresses will be accepted for carpool and lost and found ads only. Due to the volume of material received, we are unable to verify the accuracy of the statements made in the ads. Caveat emptor!

### Housing

Good-sized room in 4 bd/2 ba home. Excellent, quiet Mtn View area, close to Ames. W/D, microwave, wired for cable modem. Tidy person and N/S. Easy access to Ames, H85, 237 and 101. \$475 plus dep. and share utils. Avail. June 1, possibly sooner. Call (650) 964-1900.

Student interns looking for housing while interning at Ames. Must be close to Ames, be able to car pool into Ames or close public transportation. E-mail [eprogram@mail.arc.nasa.gov](mailto:eprogram@mail.arc.nasa.gov) with rent information.

Shared housing room for rent in excellent, quiet Los Altos area near Ames. Share house w/prof'l males/females. Large house and yard w/gardener. W/D, partly furnished, N/S/pets, \$565/mo plus dep. and 1/4 utilities. Call (408) 243-7750.

### Transportation

'87 Honda Shadow 1100cc motorcycle, 46K mls, \$1,500 or B/O. Barry Cunningham (510) 793-4457.

'97 Geo Metro. Approx 147K mls. 5 spd. New tires. Good condition. \$1,350 or B/O. Sandy (831) 338-7532.

### Car Pool

Seeking carpool from Mission district of Fremont to Ames. Work hours are somewhat flexible. Nancy ext. 4-3258.

## NAI meeting

*continued from page 13*

lights were the poster sessions that took place every afternoon. The scientific conference was followed by a full-day meeting of the NAI executive council. The only blow to the conference was a short but severe spring snowstorm, which wiped out the planned pre-meeting geology field trips and delayed the arrival of many attendees.

The primary organizers of NAI 2005 were Steve Mojzsis, chair of the Program Organizing Committee, together with Bruce Jakosky and Emily CoBabe-Ammann of Colorado University and the staff from NAI Central under the leadership of Karen Bradford of Ames. The next biennial meeting of the NAI will be in Hawaii in 2007.

BY DAVID MORRISON

## 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.

### 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-943 (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 Townhse, 3bd/2ba, View of slopes, close to lifts. Per night: \$250, two night minimum. Includes linens, cleaning, propane fireplace, fully equipped. Call (650) 968-4155, [DBMckellar@aol.com](mailto:DBMckellar@aol.com)

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

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

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

Tahoe Donner vacation home, 2 bd/2ba. trees, deck. Access to pools, spa, golf, horseback riding, \$280 wkend, \$650 week. Call (408) 739-9134.

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

Incline Village: Forest Pines, Lake Tahoe condo, 3 bd/2ba, sleeps 8. Fireplace, TV/VCR/DVD, MW, W/D, jacuzzi, sauna, pool. Walk to Lake, close to ski areas. Visit Web page for pictures: <http://www.ACruiseStore.com>. \$120/night low season, \$155/night high season (holidays higher) plus \$156 cleaning fee and 12% Nevada room tax. Charlie (650) 366-1873.

Disneyland area vacation rental home, 2 bd/1ba. Nearing completion completely remodeled w/new furniture. Sleeps 6 (queen bed, bunk beds, sleeper sofa). Air hockey and football tables. Introductory rate \$600/wk, once completed rate will be \$1000/wk. Security deposit and \$100 cleaning fee required. Call (925) 846-2781.

Ski Park City Utah, NASA Ski Week XIV, Feb 5 - 12, 2005. Space limited. E-mail Steve at [exnasa@sbcglobal.net](mailto:exnasa@sbcglobal.net) or call (408) 432-0135.

New York, 5th Ave. One fully furnished bedroom in 24 hour security bldg. overlooking Washington Square Park, \$1,000/wk or \$3,600/mo. negotiable. Call (650) 349-0238.

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

## Miscellaneous

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

Stand up freezer Kenmore \$50. Two white pine computer/bookcases - \$50 each. Joy (650) 965-4926.

Starter PC: Windows2000, 333MHz, 164MRAM, 15GB HD, 52x CD-ROM, USB, keyboard, mouse and speakers (no monitor). Perfect for first computer. \$95. Call (408) 295-2160.

Free - you haul. Refrigerator. Good condition. Sandy or Tom. Call (831) 338-7532.

TREK 'Jet 20' boy's bike, blue, 2-1/2 years old. Excellent condition. \$140 new. \$75 or B/O. Call (408) 246-8432.

Pool table. Solid maple. Dark blue cloth. Exc. cond. 4x8 Custom. \$1,300. Call (408) 269-2063.

## Ames emergency announcements

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

## Safety Data

### NASA-Ames Occupational Illness-Injury Data for Calendar Year-to-Date 2005 Jan. 1, 2005 - April 30, 2005

	Civil Servants	Contractors
Not recordable, first aid cases	12	4
Recordable no lost-time cases	3	3
Recordable LOST-TIME cases	0	0
Lost workdays	0	0
Restricted duty days	0	82

Data above is as of 5/13/05. May be subject to slight adjustment in the event of a new case or new information regarding an existing case.

# KAO marks 30th anniversary of its dedication



NASA photo by Tom Trower

The Kuiper Airborne Observatory staff and scientists in 1995 who travelled from across the country to participate in the airborne science program located at NASA Ames.

*"I must up to the skies again, to the lonely, dark night sky,  
 And all I ask is a telescope, and a star to steer her by,  
 And turbulence, and compressors whine and PFC shaking,  
 And a grey mist in the tracker field, 'fore the grey dawn's breaking."*

-- By Jim Cockrell, KAO Electrical Engineer  
 From "The Lonely Dark Night Sky" a Collection of Songs,  
 Poems, and Other Writings from the Kuiper Airborne Observatory

**See story on page 3**



National Aeronautics and Space Administration

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