NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
ASTROGRAM
Newsletter of NASA Ames Research Center, Moffett Field, California

July 2008

Moon week celebration draws hundreds of scientists

by Kelly Humphries and Michael Mewhinney

An estimated 500 scientists from all over the country converged on NASA's Ames July 21-23 as part of a "Moon Week Celebration" marking the 39th anniversary of the Apollo 11 lunar landing and the future of lunar exploration.

NASA photos by Eric James

David Morrison, interim director of the NASA Lunar Science Institute, (left), delivered a warm welcome at the opening of the Lunar Science Conference held in July at the center.

The Lunar Science Conference was co-hosted by NASA's Lunar Science Institute, NASA's Ames and the NASA Lunar and Planetary Science Institute, Houston. The three-day conference examined on-going lunar research and findings and looking forward to a new generation of opportunities for studies of the moon, on the moon and from the moon.

Featured speakers included NASA Ames Center Director S. Pete Worden, Lunar Science Institute Interim Director David Morrison and noted planetary scientist Chris McKay. Presentations were also given by space entrepreneurs and a panel of young NASA scientists and engineers looking at innovative approaches to lunar exploration and public involvement.

Organizers kicked off the research conference on Sunday, July 20, 2008,

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California Governor learns how Ames helps fight wildfires

Governor Arnold Schwarzenegger visited Ames July 14 to understand first-hand how the agency is helping firefighters battle the widespread wildfires raging throughout the state.

During the visit, Schwarzenegger reviewed firefighting data at the simulation facility used to display visible light and fire imagery, and saw a demonstration of the hyperwall-2, a high resolution visualization system displaying images from the wildfires.

NASA photo by Eric James

Governor Arnold Schwarzenegger (left) with Ames Center Director S. Pete Worden (right) during a recent visit by the governor to the center to gain first-hand knowledge about the way NASA assists in the response against wildfires.

After the quick tour, the governor held a short news briefing.

The flights by NASA's unmanned Ikhana aircraft used a sophisticated Autonomous Modular Scanner developed at Ames and satellite data from Goddard Space Flight Center. The flights originated from NASA's Dryden Flight Research Center, Edwards, Calif.

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On the Inside . . .

NASA Ames, JPL win 2007 NASA Software of the Year Award

BY RACHEL PRUCEY

Computer programs that are used to define safety margins for fiery spacecraft re-entries and help detect planets outside our solar system are co-winners of NASA's 2007 Software of the Year Award.

Software engineers at NASA's Ames developed the Data-Parallel Line Relaxation, (DPLR), which is used to analyze and predict the extreme environments human and robotic spacecraft experience during super high-speed entries into planetary atmospheres.

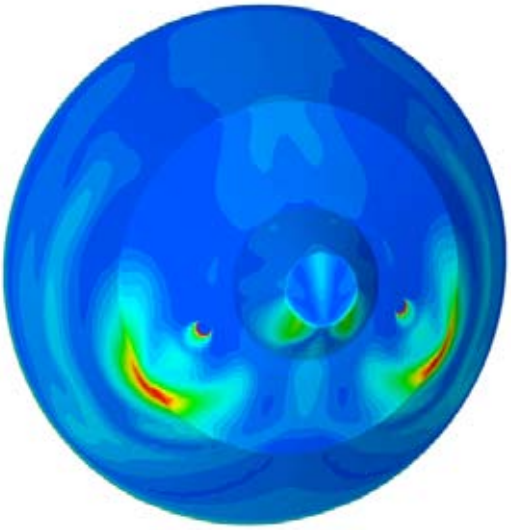
At NASA's Jet Propulsion Laboratory (JPL) in Pasadena, Calif., software engineers developed the Adaptive Modified Gerchberg-Saxton Phase Retrieval program. The software uses a telescope's science camera with innovative and robust algorithms to characterize possible errors that limit its imaging performance. The software has been integrated into calibration control loops to correct those errors, and can achieve orders of magnitude improvement in sensitivity and resolution.

The DPLR simulates the intense heating, shear stresses and pressures a spacecraft endures as it travels through atmospheres to land on Earth or other planets. It is capable of creating a highly accurate, simulated entry environment that exceeds the capability of any test facility on Earth, allowing engineers to design and apply thermal protection materials suited to withstand such intense heating environments.

The DPLR team members include Michael J. Wright, James Brown, David Hash, Matt MacLean, Ryan McDaniel, David Saunders, Chun Tang and Kerry Trumble.

JPL's software can be applied to other sciences and systems that use light, such as laser communications and extrasolar planet detection.

JPL's Adaptive Modified Gerchberg-Saxton Phase Retrieval software already is in use at the California Institute of Technology's Palomar Observatory, in northern San Diego County. The software played a significant role in designing such next-generation telescopes as NASA's James Webb Space Telescope, scheduled to launch in 2013.



Modeling of a reaction control system with heat transfer contours on Mars Science Laboratory, using the Data-Parallel Line Relaxation computational fluid dynamics code.

NASA photo by Kerry Trumble

An eight-person team from JPL is responsible for the Adaptive Modified Gerchberg-Saxton Phase Retrieval software: Scott Basinger, Siddarayappa Bikkannavar, David Cohen, Joseph Green, Catherine Ohara, David Redding and Fang Shi.

Early work for the software was based on efforts to correct the vision of NASA's Hubble Space Telescope. After initial images came back blurry, engineers worked for months to determine the problem. Eventually, astronauts traveled to the telescope to install a corrective lens based on telescope-imaging errors.

A NASA Software Advisory Panel reviews entries and recommends winners to NASA's Inventions and Contributions Board for confirmation. Entries are nominated for developing innovative technologies that significantly improve the agency's exploration of space and maximize scientific discovery.

Both Ames and JPL have won or been co-winner of the award seven times, including three out of the past four years, since the NASA Software of the Year Award was initiated in 1994.

For more information about NASA's Inventions and Contributions Board, visit: http://icb.nasa.gov

Worden greets employees at Ames front gate

Ames Center Director S. Pete Worden checked badges and greeted Ames employees at the Arnold Gate as they arrived at work on July 1. Worden's 'gate duty' was conducted to heighten awareness of center management's concern for security at the center.

NASA photo by Dominic Hart

NASA coats main mirror for airborne observatory

BY MICHAEL MEWHINNEY

The main mirror for NASA's new airborne eye on the universe is now ready for installation after being transformed from a carefully shaped and polished piece of glass into a highly reflective optical component at Ames.

After years of development and preparation, it took just 20 seconds to apply the shiny, aluminum coating to the glass mirror for the Stratospheric Observatory for Infrared Astronomy (SOFIA). The telescope is scheduled to begin observations in mid-2009.

"The change was quite sudden and stunning. One moment, we were looking through the transparent glass mirror into its honeycomb-shaped internal structure, and then seconds later, all we saw were reflections," said Patrick Waddell, a systems engineer with the Universities Space Research Association (USRA), which manages the SOFIA science mission for NASA.

"There were quite a few technical challenges that caused us to question whether the coating quality would be this good on the first try. We're ecstatic," said Ed Austin, NASA's SOFIA project manager at Ames.

Project engineers completed the first mirror coating of the German-built telescope, a major project milestone, in a 10-ton, 16-foot-tall stainless steel vacuum chamber at Ames. SOFIA optical engineers and scientists will annually re-coat the mirror, as is done for other large research telescope mirrors, and also routinely clean the mirror.

"The telescope's mirror surface must be highly reflective and clean to ensure the quality of our astronomical observations," said Tom Roellig, SOFIA project scientist. "Keeping the mirror in prime condition ensures that images from space are sharp and precise and that infrared observations are not degraded by heat radiation from dust on the mirror."

One of the challenges to a successful coating of the mirror was proper selection and testing of vacuum-compatible materials that support the large structure containing the mirror, known as the mirror cell. According to project scientists, modern telescopes include more of the mirror cell in the coating chamber during the process to simplify telescope disassembly and reassembly.

NASA photo by Eric James

Technicians at NASA's Ames inspect the main mirror for NASA's new airborne eye on the universe, which is now ready for installation after being transformed from a carefully shaped and polished piece of glass into a highly reflective optical component. After years of development and preparation, it took just 20 seconds to apply the shiny, aluminum coating to the glass mirror for the Stratospheric Observatory for Infrared Astronomy (SOFIA) in a 10-ton, 16-foot tall stainless steel vacuum chamber. The telescope is scheduled to begin observations in mid-2009.

SOFIA is unique because the mirror cell is largely composed of carbon fiber reinforced plastic (CFRP), a material commonly found in tennis racquets and modern sailboat hulls. These types of composite materials provide the light weight and stiffness required for precision airborne optical components, but also easily absorb moisture from the air.

The SOFIA Primary Mirror Assembly contains 1,950 pounds of glass and more than 2,400 pounds of CFRP. When the mirror and mirror cell were in the coating chamber and air was removed from the chamber, it took nearly a week for the CFRP to release its absorbed moisture, approximately one pint. After the moisture was removed, the pressure in the coating chamber was low enough for the mirror coating process to begin.

The coating chamber vaporizes aluminum by heating more than 60 tungsten filaments around its edges. These filaments have shapes similar to ones found in ordinary light bulbs, but are much larger.

Each filament is laced with small twists of 99.999 percent pure aluminum wire.

The aluminum coating applied to the mirror glass is only five one-millionths of an inch thick, approximately 1/300 of the thickness of a human hair, and weighs slightly more than 1/14 of an ounce, equivalent to 1/7 of the metal in a soda can.

SOFIA is comprised of a heavily modified Boeing 747SP aircraft that will carry a 2.5-meter (98-inch) diameter telescope into the stratosphere to conduct astronomical research, and a ground-based science center. SOFIA is a joint program of NASA and the German Aerospace Agency, Deutsches Zentrum fur Luft- und Raumfahrt (DLR).

The SOFIA program is managed by NASA's Dryden Flight Research Center, Edwards, Calif., and the aircraft is based at the NASA Dryden Aircraft Operations Facility, Palmdale, Calif. Ames manages the science project.

For general information about SOFIA, visit: http://www.nasa.gov/sofia. For science information about SOFIA, visit: http://www.sofia.usra.edu

CARB sniffs the air over California as wild fires rage

by Deborah Robin Croft

In an effort to better understand the chemical nature of smog and greenhouse gases, scientists from the California Air Resources Board (CARB) collaborated with NASA scientists and recently flew specially configured aircraft -- the DC-8 and the P-3 -- up and down the California coast and over the Central valley at varying altitudes.

These airborne platforms took hundreds of air samples and measuring the composition of chemicals in the atmosphere over California. The CARB initiative is part of the larger Arctic Research of the Troposphere from Aircraft and Satellites (ARCTAS) field campaign that is examining the role that migrating air pollution is playing in the Arctic's changing climate.

NASA's DC-8 airborne laboratory logged about 33 flight hours, taking four flights from the NASA Dryden Aircraft Operations Center, Palmdale, over an area extending from San Diego to as far north as Trinidad Head along the coast north of Eureka, Calif. NASA also sent a specially outfitted P-3 aircraft on one eight-hour flight from Ames and an ER-2 from NASA's Dryden Flight Research Center, Edwards, Calif., to fly over the state for additional sampling during the same time period.

The collected samples will help CARB identify the sources of greenhouse gas emissions throughout California, transboundary pollution from Asia and Mexico, and emissions from the extensive wildfires currently devouring large swaths of acreage in the state. Another scientific objective is to understand the different types of pollution blowing into California from offshore vessels and to differentiate air mass chemistries between urban and rural areas.

"We will provide highly advanced capability to develop critically needed information on pollutant emissions and atmospheric concentrations both offshore and onshore over California, allowing us to better model air quality and future climate change," said Hanwant Singh, an Ames project scientist.

"This collaboration will give us information on how pollution is created, transported and even destroyed," said Bart Croes, chief of the Air Resources Board's Research Division. "The use of highly sophisticated technology, data gathered at levels far beyond our normal reach and collaboration with NASA's very knowledgeable technicians and scientists, combine to create a rare opportunity."

NASA photo by Eric James

California Air Resources Board (CARB) mission photo shows smoke from the recent Big Sur fire.

Flights will be coordinated with a series of NASA Earth-observing satellites as they pass over the state. Researchers can use these simultaneous measurements to validate satellite data and improve modeled predictions of the impact of atmospheric pollution on California.

The Air Resources Board, a department of the California Environmental Protection Agency, has been a leader in developing and implementing aggressive pollution control measures to combat smog and particulate matter for 40 years. The agency is also working to reduce 25 percent of the state's greenhouse gas emissions by 2020, as required by the Global Warming Solutions Act that Governor Arnold Schwarzenegger signed in 2006.

ARCTAS Summer Deployment

The ARCTAS campaign is a two-part scientific mission taking place this year, a designated Polar Year, using air borne measurements and satellite data in order to study man-made and forest fire pollution that has traveled into the Arctic atmosphere. Over 120 scientists are supporting the ARCTAS summer mission that will take place in Cold Lake, Canada while about 25 will participate in Yellow Knife, Canada.

Pollutants from forest fires are of particular interest to these researchers. Pollution from China and other nations on the Far East have also migrated to the Arctic and will be studied.

The data gathered through the CARB flights will provide a chemical footprint that can be examined to see how much and what type of pollutants are traveling to the Arctic region and what the chemical consequences are for the global climate.

What is the Conflict Management Program?

CMP is a comprehensive agency-wide program designed to provide NASA managers, supervisors and employees with effective tools to more strategically address workplace conflicts through early engagement in conflict resolution discussions, without the need for third-party intervention.

CMP will encompass:

• Center-by-center needs assessment of issues around workplace conflict;

• Training for managers, supervisors and employees to develop trust-building, enhanced communication, collaborative problem-solving and conflict resolution skills and strategies;

• Center EEO staff training and ADR (alternative dispute resolution) team training; and

• Completion of review of current center and agency EEO ADR programs to establish a consistent policy and procedural framework

What are the next steps?

• Conduct CMP assessments at the NASA centers;

• Conduct on-going conflict management training for managers, supervisors and employees at the NASA centers;

• Conduct ADR team and EEO staff training sessions at the remaining centers;

• Pilot one-on-one conflict management assistance at NASA Headquarters and in the future offer it at the other NASA centers; and

• Complete the evaluation of agency and center EEO ADR programs and develop an agency-wide policy and procedural framework.

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Moon week celebration draws hundreds of scientists

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with a free public event that included panel discussions about the moon, fun educational activities for children and families – such as compressed air rocket launches -- and NASA Apollo film documentaries. Families also had opportunities to create lunar craters and build miniature solar systems out of edible materials. More than 600 people attend the various events on Sunday.

Managed by NASA Ames, the Lunar Science Institute is modeled after the successful NASA Astrobiology Institute and features teams of scientists across the country collaborating in lunar science and future lunar exploration. The new institute expects to select four or five research teams for grants of $1 million to $2 million each for four-year terms. By the end of this year, NASA officials say as many as 50 scientists may be working in collaboration with the new institute.

Visitors participating in the science activities at the recent free public lunar science event held on July 20, 2008.

As part of a celebration of the 39th anniversary of the Apollo 11 landing on the moon on July 20, 1969, NASA's Ames and the NASA Lunar Science Institute hosted a festive public lunar event on July 20, 2008.

Ames Center Director, S. Pete Worden, spoke at the NASA Lunar Science Conference event on July 20, 2008. Conference attendees discussed current lunar research and plans for future exploration of the moon.

Students build rockets at the Lunar Science Conference family event on July 20, 2008.

NASA photos by Eric James

Ames Astrobiologist discusses life's extreme environments

BY SANA BAKSHI

"In Astrobiology, we take a much longer view. We aren't only interested in today, we are interested in a hundred years, a thousand years, a billion years," said Lynn Rothschild, Ames astrobiologist, at a director's colloquium held in July at the center.

NASA photo by Nick Tran

Lynn Rothschild, an astrobiologist at Ames, spoke recently at the center about extreme environments.

Rothschild discussed her areas of expertise: evolutionary biology and astrobiology. As an astrobiologist and evolutionary biologist and a professor at Stanford University, she has conducted considerable research about astrobiology and organisms living in extreme conditions.

Rothschild has been featured on television shows such as BBC, National Geographic and Discovery Channel.

Her talk, entitled, "Life in Extreme Environments: Sunburn, Sex and Life in the Universe," focused on the effect of radiation and how organisms and how genes tie into mutations. Rothschild also discussed life in extreme environments and the organisms that can survive in those harsh conditions.

Her field of research concerns life in the most extreme areas and how life can survive there. Spending so much time in these places forces her to think of whether or not life can exist outside of the Earth's atmosphere. Rothschild's studies have also led her to study the area of extremophiles.

Rothchild gives these organisms the identity of champions, calling them "the Olympians of the biological world. Rather than who can jump the highest or run the fastest, it's more who can live at the lowest pH or the highest temperature." Rothschild said that conditions such as pH, temperature, radiation, pressure, and other conditions determine whether or not an organism is an extremophile.

According to Rothschild, being an aerobic organism is dangerous to our health, yet humans have adapted to needing oxygen, making us extremophiles. Adaptation has a lot to do with extremophiles. For example, a Lassen, or snow alga, turns red to protect itself from radiation.

Now, according to Rothschild, space being the new extreme, if exploration can lead one to find a similar extreme on both a planet and Earth then there is a chance of life in space.

She noted that it has become crucial for humans to find a new place to live other than Earth. According to Rothschild's extensive study, in about 1.3 billion years the Earth will change for the worse. The oceans will dry up and Pangaea will form again. But then again, the human race is a race that will probably do something about this, and as Rothschild said, " I firmly believe we aren't going to take this lying down."

According to Rothschild, the future is an uncertain place.

"I feel in the history of the Earth we are at a tipping point between a Greek tragedy, where we are starting to see the future that the fates have decreed and moving into Dickens' 'A Christmas Carol' where we can see the future and we can wake up and do something about it," Rothschild said.

Ames personnel lauded for historic preservation efforts

The non-profit California Preservation Foundation (CPF) recently announced the recipients of its 2008 Preservation Design Awards. NASA Ames was recognized in the "Cultural Resources Studies and Reports" category.

Keith Venter, historic preservation officer, Code RCE, and Tom Anderson, senior environmental compliance specialist, Integrated Science Solutions, Inc., were commended for their outstanding leadership. Together with Rich Sucre, Page and Turnbull, San Francisco, they prepared the report on "Evaluation of Historic Resources Associated with the Space Shuttle Program at Ames Research Center."

The Ames Environmental and History offices also provided important support that lead to this prestigious recognition. In announcing the award, CPF executive director Cindy Heitzman praised the team for its "exemplary contribution to the preservation of California's rich and diverse historic resources."

With the space shuttle program scheduled to end in 2010, NASA initiated an historical survey and evaluation of all agency facilities that have supported that program to determine their eligibility for the National Register of Historic places.

The assessment was completed in compliance with relevant sections of theNational Historic Preservation Act; the National Environmental Policy Act; Executive Order 11593, Protection and Enhancement of the Cultural Environment; Executive Order 13287, Preserve America; and other relevant legislation.

The award will be presented at a ceremony on Oct. 18, 2008, in Long Beach, Calif., aboard the Queen Mary. NASA Headquarters and Ames personnel will be in attendance to receive the award.

Boeing official discusses future of air travel

by Sana Bakshi

Air travel has come a long way in the past century.

From the Wright brothers' famous first flight to the latest Boeing 777, airplanes are improving to meet the needs of their customers, according to Andrew "Drew" Magill, director of marketing for Boeing Commercial Airplanes, who spoke at Ames about the future of air travel.

According to Magill, the market is expanding. In 20 years, the market in China will be bigger than it is today in North America. North America will grow 2.8 percent in the next 20 years and Asia-Pacific will grow 7.2 percent.

As the market gets bigger, more and more people will be flying for various reasons. For example, Magill noted, with the expansion of air travel more businesses will be able to expand their ventures into other countries.

With more people traveling, airlines will try to accommodate more for the passengers needs.

" Safe, reliable, convenient air travel, for lower fares with comfortable surroundings. That's the motto for all airlines and Boeing. But it isn't just one of these things, its all of these things combined" Magill said.

Andrew "Drew" Magill spoke recently at the center about the future of air travel.

NASA photo by Nick Tran

The new 787 Boeing airplane will have many noticeable changes from what one is accustomed to on older airplanes. One big change in the airplanes that one will notice upon first entering the airplane is a different look at the entrance of the airplane. Also, the windows of the new aircraft are much bigger, so that passengers can see the horizon. Another big change is that there will be a lot more room for one to move around and everyone will be able to have a fairly large carry on bag. After one places their carry on bag in the overhead storage space, the storage spaces swing over to the side allowing maximum space for the passenger comfort. Also the lights in the airplane will be set to stimulate a day and a night to help your body adjust to its destination timing.

NASA considers development of student-led satellite initiative

by Rachel Prucey

NASA is considering the development of a university-based, student-led satellite development initiative to begin passing the space exploration torch to a new generation.

The American Student Moon Orbiter, or ASMO, concept invites students, faculty and industry leaders in the U.S. with experience in university-based, student-led spaceflight projects to respond to a Request for Information, which is planned for release this month and will remain open for at least 90 days. The orbiter will be a small satellite that could orbit the moon and carry scientific instruments designed and developed by students. It is aligned with NASA's lunar exploration agenda.

"It is important to provide meaningful experiences to our next generation of engineers, but we need to do it in a thoughtful way," said Dr. Joyce Winterton, assistant administrator for Education at NASA Headquarters in Washington. "By collecting input from universities with experience in this area, we can make the correct decision about whether to proceed, and if so, how."

Under the ASMO concept, teams would learn directly from NASA mentors as part of a diverse, nationwide, higher education initiative that enables students to design, build, launch, operate and own a small spacecraft and its payload. Students would acquire in-depth experience with satellite mission protocol and procedures, communications and project management. NASA's Ames and NASA's Glenn Research Center in Cleveland are leading the ASMO initiative.

"NASA is laying the foundation for a multi-generation exploration program that eventually will see humans settle our solar system," said Ames Center Director S. Pete Worden. "To sustain this vision, we need the next crop of scientists and engineers to engage their minds and get hands-on experience."

NASA's Office of Education provides opportunities to prepare college and university students for successful aerospace careers through real-world applications of their science, technology, engineering and mathematics skills.

To respond to the American Student Moon Orbiter Request for Information, visit: http://asmo.arc.nasa.gov

SETI hosts family interactive science fair

SETI (Search for Extraterrestrial Intelligence) hosted a "Celebrating Science 2008" family event July 19 at its site in Mountain View to celebrate science. The activities included an interactive science fair for the entire family. SETI scientists, including astronomer Peter Jenniskens, bottom left photo, left, were on hand to talk about the institute's pioneering exploration of life, the solar system and beyond. For more information about SETI, visit: http://www.seti.org/

photos by Astrid Olson

NASA photo by Dominic Hart

Trent talks about biofuel production

Recently, Jonathan Trent, currently the project scientist on an exploratory biofuels project at Ames, presented a director's colloquium entitled, "Global Research into Energy and the Environment at NASA (GREEN)" to provide information about our effort to develop a research program seeking innovative new ways to produce biofuels and reduce our dependence on oil.

Arnold presents colloquium about historical perspective of Ames

NASA photo by Eric James

James Arnold presented a director's colloquium on July 22 entitled, "Synopsis of Ames Contributions to Entry Technology and Applications: A Historical Perspective 1953 - 2036." This presentation built upon the first in the 2008 summer lecture series by Jack Boyd: "Reflections of NASA's 50th Anniversary: The Giants on Whose Shoulders we Stood." The focus in this presentation was on Ames-specific contributions to the field of entry technology and their application to NASA programs and missions.

In memory of . . .

George Hopf-Lovette, a talented painter, fly fisherman and recently retired aerospace engineer at NASA's Ames, died on June 18, 2008, after a brief illness at Kaiser Hospital in Redwood City. He will be remembered for his intellectual curiosity, his sensitivity and especially for his spectacular skills as a cook.

He is survived by his wife, Christine and his son, Thomas, of Redwood City and his brother, Paul Lovette, of San Rafael. A private celebration of his life will be held at a future date.

California Governor learns how Ames helps fight wildfires

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NASA photos by Eric James

Governor Arnold Schwarzenegger reviewed firefighting data at the simulation facility used to display visible light and fire imagery, shown in photo at left. He also saw a demonstration of the hyperwall-2, a high resolution visualization system displaying images from the wildfires, standing, shown in photo at right.

NASA and the U.S. Department of Agriculture's Forest Service have partnered to obtain imagery of the wildfires in response to requests from the California Department of Forestry and Fire Protection, the California Governor's Office of Emergency Services and the National Interagency Fire Center.

This visit represented an excellent opportunity to demonstrate both the effectiveness of interagency (and inter-center) partnerships in fighting these unprecedented fires, and the extraordinary utility of tools developed by NASA to help face challenges on Earth.

Kendall talks about CSA's space program

NASA photo by Nick Tran

Dr. David Kendall, Director General of the Space Science Program of the Canadian Space Agency (CSA), visited Ames in July and presented a colloquium on CSA's Space Science and Exploration Program.

Ames Ongoing Monthly Events Calendar

Ames Amateur Radio Club, third Thurs., of ea. month, 12 noon, N-T28 (across from N-255). POC: Michael Wright, KG6BFK, 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 Bicycling Club, every third Wednesday of each month, 12 noon - 1 p.m., Bldg. N-245 Auditorium. POC: Julie Nottage at jnottage@mail.arc.nasa.gov, ext. 4-3711.

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

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

Ames Contractor Council Mtg., first Wednesday of ea. month, 11 a.m., Bldg. N-200, Committee Room. POC: Kathleen Starmer, ext. 4-6959

Environmental Forum, first Thursday every other month, 9 a.m. - 10 a.m., T20-G conference Rm. 129. URL: http://q/qe/events/EHS-series/ POC: Stacy St. Louis, ext. 4-6810.

Ames Federal Employees Union (AFEU) Mtg, First Wednesday of November (7th), noon. First Wednesday of December (5th), noon. Bldg. N-247, Rm. 109. Beginning 2008, third Wednesday each month, same location. Guests welcome. Info at: http://www.afeu.org. POC: Paul K. Davis, ext. 4-5916.

The Hispanic Advisory Committee for Excellence (HACE) Mtg., first Thursday of each month, 11:45 a.m. - 12:45 p.m., Bldg. N-255, Rm. 101C. POC: Eric Kristich, ext. 4-5137 and Mark Leon, ext. 4-6498.

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

Ames Mac Support Group Mtg., third Tuesday of each month, 11:30 a.m.to 1 p.m., Bldg. N-262, Rm 180. POC: Tony ext. 4-0340.

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

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

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

Ames Safety Committee, third Thursday of each month, 10 a.m. - 11 a.m., Bldg. N-237, Rm. 201. POC: John Livacich, jlivacich@mail.arc.nasa.gov, ext. 4-3243 or Terry Reichert, treichert@mail.arc.nasa.gov, ext.-4-0375.

Ames Sailing Club Mtg., second Thursday of each month (March through November), from 12 p.m. - 1 p.m., Bldg. N-260, Rm. 113. URL: http://sail.arc.nasa.gov/. POC: Clif Horne, ext. 4-4571.

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 2008 Jan. 1, 2008 - June 30, 2008

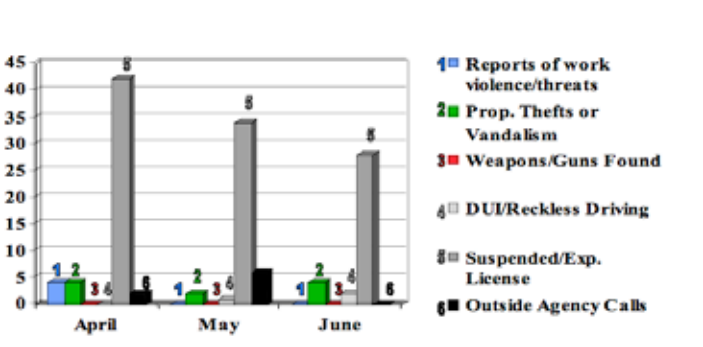
	Civil Servants	Contractors
First aid cases	13	9
Lost Workday cases	1	3
Recordable cases	2	4
Restricted duty days	0	2

Above data are as of June 30, 2008. May be subject to slight adjustment in the event of a new case or new information regarding an existing case.

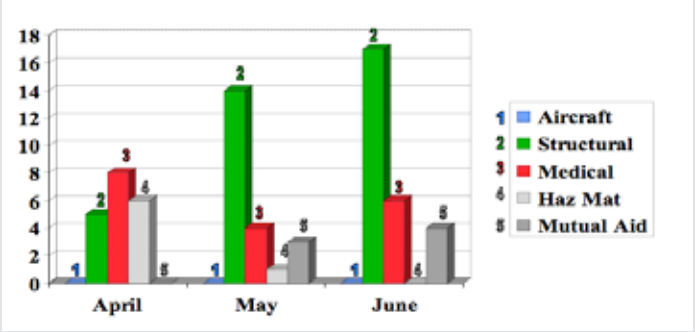
Protective Services monthly activity

A statistical summary of activities of the Protective Services Division's Security/Law Enforcement and Fire Protection Services units for the month of June 2008 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 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

House for rent, 2bd/1 ba. including detached studio, vaulted ceiling, bath. Minutes from Ames. Pride of ownership here. Quiet, safe tree-lined street close to Castro. R.V parking area. House comes with a gardener. Cats are OK-purr. Drive by 515 Pettis Avenue/Mercy. $2,750 or offer. Paul (650) 968-1580 or Rans (408) 554-1818 ext. 246. Cell (408) 688-6907.

Fully furnished, 1,600 sq ft 2 bd/2 ba condo in Los Altos available for rent from Sept. 15, 2008 to June 15, 2009. $2,200 per month plus security and cleaning deposits. No smoking and prefer no pets. Rich or Barbara (650) 856-7873.

Ames Cat Network

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.

Astrogram deadlines

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

Exchange Information

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

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

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

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

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

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

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

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

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

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

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

NASA Lodge (N-19) 603-7100

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

Ames Swim Center (N-109) 603-8025

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

Ongoing Vacation Opportunities

Lake Tahoe-Squaw Valley Townhse, 3bd/2ba, View of slopes, close to lifts. Per night: $250, plus $145 cleaning fee. Two night minimum. Includes linens, propane fireplace, fully equipped. Call (650) 968-4155, DBMcKellar@aol.com.

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

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

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

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

New York, 5th Ave., one fully furnished bedroom apt. in 24 hour security fbldg. overlooking Washington Square Park, $1,000/week or 3,000/month, negotiable. Call (650) 430-6977.

Paris/France: Fully furnished studio. 5th arr, Latin Quarter, Notre Dame and Lie-St. Louis, $1,400/week, negotiable. Call (650) 430-6977.

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

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

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

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

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

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

PM Challenge 2009 Call for Speakers

Proposal submissions are due Sept. 12, 2008. Connect and Discover! Do you have a topic of interest to NASA program and project management stakeholders? Submit your speaker proposal for PM Challenge 2009.Find out more at: http://pmchallenge.gsfc.nasa.gov/speaker2009.htm

Also check out our podcasts, now available on I-Tunes: http://phobos.apple.com/WebObjects/MZStore.woa/wa/viewPodcast?id=285335132

Visiting Stanford professor outlines quantum mechanics

On July 23, the Commonwealth Club and NASA's Ames Research Center co-sponsored a lecture by Leonard Susskind Professor of Theoretical Physics at Stanford University and author of "The Black Hole War: My Battle with Stephen Hawking to Make the World Safe for Quantum Mechanics."

Recognizing the contradiction behind Stephen Hawking's claim that things disappear in black holes, Susskind and Gerald 't Hooft offered a counterargument aimed to disprove one of the most controversial theories presented in recent years.

Susskind discussed his personal story behind the black hole conflict and how it has led to a better understanding of our how our universe works. Susskind's current research is involved with the following topics: models of internal structure of hadrons, gauge theories, quark confinement, symmetry breaking, instantons, quantum statistical mechanics, baryon production in the universe, model for fermion masses, gravity in lower dimensions and quantum cosmology.

NASA photo by Dominic Hart

Stanford Professor of Theoretical Physics Leonard Susskind recently discussed the topic of quantum mechanics at the center.

Dowling discusses quantum optical metrology

NASA photo by Eric James

Dr. Jonathan Dowling presented a director's colloquium on July 23 at Ames entitled, "Quantum Optical Sensing, Imaging and Computing." Dowling reviewed some of the recent theoretical and experimental advances in the exciting new field of quantum optical metrology, focusing on examples that exploit a particular two-mode entangled photon state the High-N00N state. Dowling is a Horace C. Hearne Jr. professor of theoretical physics and co-director of the Hearne Institute for Theoretical Physics, Louisiana State University, Baton Rouge, La.

What's on InsideNASA . . .

NASA Deputy Administrator Shana Dale's corner on InsideNASA this month features an article entitled, "The Ad Astra Rocket Company." Following is an excerpt from the article.

NASA drives innovation, creating real benefits for a modest investment of less than six-tenths of one percent of the overall federal budget.

One example is the Ad Astra Rocket Company, which was founded by retired astronaut Dr. Franklin Chang Díaz. Chang Díaz enjoyed a very successful career at NASA, flying on seven shuttle missions and earning four Distinguished Service Medals. He also spent much of his time at NASA working on the VASIMR™ engine, a new space propulsion system based on plasma. Plasma is simply a super hot form of gas, similar to the sun and the interior of stars.

Plasma is the stuff from which stars are made. Chang Diaz left NASA in 2005 to form the "Ad Astra Rocket Company," through a privatization agreement of the NASA technology. Ad Astra's goal is to commercialize the VASIMR™ system in the emerging market of private space operations and services. Work is proceeding at a rapid pace.

To learn more about Ad Astra Rocket Company and Chang Diaz, visit http://insidenasa.nasa.gov/nasa_stories/Ad_Astra_Rocket_Company.html

What is the Conflict Management Program?

continued from page 4

What are the Expected Outcomes of CMP?

- A proactive approach to reduce institutional risks and costs, associated with formal complaint processes such as EEO;
- Expanded use of resolution skills to prevent and manage conflict, with benefits beyond EEO;
- Strengthened partnerships among EEO, HR, legal another stakeholders;
- An institutionalized framework for conflict management that provides for consistent EEO ADR agency and center policy directives and procedures; and
- Greater utilization of the EEO ADR program when third-party intervention is necessary.

ASTROGRAM

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