

January 2008

## Huge crowd turns out for SOFIA's first visit to Ames

BY MICHAEL MEWHINNEY



NASA photo by Carla Thomas, Dryden Flight Research Center

NASA's Stratospheric Observatory for Infrared Astronomy (SOFIA) flew up to Ames from Dryden Flight Research Facility, where the aircraft is undergoing flight tests, on Monday, Jan. 14, arriving mid-day under sunny skies.

They came by the thousands -- Ames employees, their families, members of the news media, aviation buffs and others who had worked on the project -- to see SOFIA during its first visit to Ames Research Center.

It was quite a day. NASA's Stratospheric Observatory for Infrared Astronomy (SOFIA) flew up from Dryden Flight Research Facility, where the aircraft is undergoing flight tests, on Monday, Jan. 14, arriving mid-day under sunny skies.

Touching down gently along the runway, the world's largest aerial observatory dwarfed its predecessor, the Kuiper Aerial Observatory, affectionately known simply as "the Kuiper," parked nearby.

Gliding smoothly along the flight line, the gleaming white aircraft glistened in the sunshine as it slowly taxied over to the front of the Airfield Operations Building, 158. There, like

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## NASA Ames explores possible collaboration with South Korea

BY MICHAEL MEWHINNEY

NASA Ames and the Korea Advanced Institute of Science and Technology, (KAIST), South Korea's premier research and education institution, signed a memorandum for the

record on Jan. 26, 2008, an important milestone in a new relationship under development.

Ames Center Director S. Pete Worden and KAIST President Nam Pyo Suh have now agreed to initiate

technical discussions on specific areas of potential collaboration involving small satellite research and development. These potential areas for future collaboration include satellite communication, navigation systems, planetary exploration, lunar science, rovers, small satellites and related technologies.

"We are exploring a new partnership with South Korea in future satellite research and development," said Worden. "We are looking forward to working with the Korea Advanced

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President of the Korea Advanced Institute of Science and Technology, Nam Pyo Suh (left) shakes hands with Ames Center Director S. Pete Worden after they both signed a memorandum for the record on Jan. 26 at Ames. This new relationship initiates technical discussions on potential collaboration involving small satellite research and development.

NASA photo by Eric James

### On the Inside . . .

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## Scientists make voyage over Arctic to study meteor shower

BY PETER JENNISKENS

On the evening of Jan. 3, 2008, NASA Ames hosted an airborne observing campaign that took an international team of 14 researchers

compensate for the rotation of Earth, and to keep the shower in view throughout the mission. We flew north when the radiant was about to set, and returned south when the radiant

and slow-moving meteors, some 846 of which were observed during the flight. The video tapes are likely to contain many more.

The Quadrantid Multi-Instrument Aircraft Campaign (MAC) deployed 25 cameras of various types and purpose. For eight hours, visual observers scanned the video feed of intensified cameras aimed above the crystal clear horizon and counted meteors, the tally of which provided a first solid glimpse of the fascinating origin and history of the Quadrantid meteor shower. They found highest rates occurred around 12 a.m. (PST). This is later than scientists had predicted, 6 p.m. to 11:37 p.m. (PST), which has caused some head scratching among the modelers on our team.

The Quadrantid shower is caused by a steeply inclined sheet of meteoroids that stretches from Earth's orbit to the orbit of Jupiter, where the heavy planet frequently perturbs the meteoroid orbits in and out of Earth's path. This can potentially lead to



A composite image of the Quadrantid shower with 15 Aurigids observed on Jan. 3 from the aircraft by Jeremie Vaubaillon (Caltech). The meteors spanned the period covering the return leg of the mission. The aurora was among the first of the new solar cycle, cycle 24.

above the Arctic Circle in a Gulfstream V aircraft for an unprecedented view from a lofty altitude of 47,000 feet of a mysterious meteor shower called the "Quadrantids."

The mission departed during one of the strongest rain storms in years, but when the aircraft emerged from the cloud deck, the sky was brilliantly clear and remained so throughout the flight. The view over the horizon provided a large surface area for spotting Quadrantid meteors, little dimmed by the low atmospheric extinction at altitude.

Observers on the ground are often plagued by the fact that the Quadrantids are mostly a daytime shower, disappearing from view around midnight when the radiant of the shower sinks below the horizon, only to appear again in the early morning hours. The Quadrantids are about eight hours wide, at half the peak rate, and the shower is impressive only when the peak happens to occur in the early morning hours. When that happens, it can outshine other strong annual showers, such as the Perseids and Geminids.

The flight path was designed to

was rising. This allowed us to observe the Quadrantid shower under nearly constant viewing conditions the whole time the peak was expected to occur. We kept the radiant at elevations between 15 and 30 degrees throughout the mission. This meant the Quadrantids were entering the atmosphere at a shallow angle and created long-lasting

large variations in peak activity and in peak time. The goal of the mission was to disentangle those effects from the variations caused by difficult and changing observing conditions on the ground.

How much influence Jupiter has depends on how much dispersion the

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NASA photo by Eric James

The Quadrantid airborne meteor observing campaign crew members standing in front of the Gulfstream V aircraft that flew the team over the Arctic. From left to right: Danielle Townsend, Ron Dantowitz, Jim Albers, Robin Gray, Mike Koop, Jeremie Vaubaillon, Mike Wilson, Jason Hatton, Peter Jenniskens, David Nugent, Juergen Wolf, Karsten Schindler and David Holman.

# NASA's LCROSS mission moves closer to launch

BY JONAS DINO

Cameras and sensors that will look for the presence of water on the moon have completed validation tests and been shipped to the manufacturer of NASA's Lunar CRater Observation and Sensing Satellite.

The science instruments for the satellite, which is known as LCROSS, departed NASA Ames, for the Northrop Grumman Corporation's facility in Redondo Beach, Calif., to be integrated with the spacecraft. LCROSS is scheduled to launch with the Lunar Reconnaissance Orbiter aboard an Atlas V rocket from Cape Canaveral, Fla., by the end of 2008.

"The goal of the mission is to confirm the presence or absence of water ice in a permanently shadowed crater at the moon's south pole," said Anthony Colaprete, LCROSS principal investigator at Ames. "The identification of water is very important to the future of human activities on the moon."

In 2009, LCROSS will separate into two parts and create a pair of impacts on the permanently dark floor of one of the moon's polar craters. The spent Centaur upper stage of the Atlas V rocket will hit the moon, causing an explosion of material from the crater's surface. The instruments aboard the satellite will analyze the plume for the presence of water ice or water vapor, hydrocarbons and hydrated materials. The satellite then will fly through the plume on a collision course with the lunar surface. Both impacts will be visible to Earth and lunar-orbiting instruments.

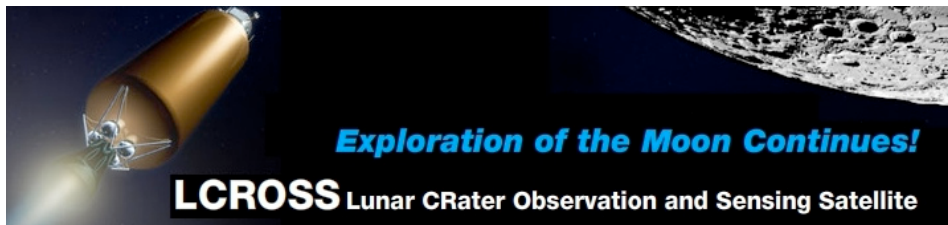
Northrop Grumman is designing and building the spacecraft. After installing the instruments on the satellite, Northrop Grumman will test the entire spacecraft system to ensure it is flight worthy.

During development of the LCROSS payload, Ames engineers and scientists built new spaceflight hardware and used new testing procedures to take advantage of lower cost,

commercially available instruments. The team subjected the commercial instruments and NASA-developed components to conditions simulating

said Daniel Andrews, LCROSS project manager at Ames. "LCROSS primarily is using commercial off-the-shelf instruments on this mission to meet the mission's accelerated development schedule and cost restraints."

"This arrangement has proven to work very well," Andrews added.



NASA photos by Dominic Hart

Mission support specialists completing the validation tests on the NASA Lunar CRater Observation and Sensing Satellite components (LCROSS) at Ames (top photo) and packaging LCROSS for shipment to Northrop Grumman Corporation in Redondo Beach, Calif (bottom photo.) LCROSS will leave for the moon in 2008 to confirm the presence or absence of water ice in a crater at the moon's south pole, by impacting the moon's surface, thereby creating particles to emerge. LCROSS' instruments will then analyze the particles.

the harsh environment of spaceflight. Working closely with the commercial instrument manufacturers, all safety and operational concerns were addressed quickly and efficiently.

"This payload delivery represents a new way of doing business for the center and the agency in general,"

"The vendors work with their products and develop a spaceflight knowledge base, and the LCROSS project gets very mature products for deployment on this mission."



# Huge crowd turns out for SOFIA's first visit to Ames

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visiting royalty, SOFIA greeted her guests.

Approximately a dozen local reporters gathered to observe the arrival and landing of the unique aerial observatory, a converted 747SP aircraft that formerly saw service with United Airlines. The mood of the crowd resembled the excitement of watching another famous 747, Air Force One, land at Moffett Field on numerous previous occasions.

Notebooks in hand and hoisting their cameras, the reporters ascended the steep steps and entered the cavernous observatory, where they



*A curious toddler checks out the wheel on the aircraft.*

NASA photo by Jon-Pierre Wiens



*Thousands of visitors came to see NASA's Stratospheric Observatory for Infrared Astronomy aircraft when it flew up from Dryden to Ames on Jan. 14.*

NASA photo by Eric James

photographed the massive 2.5 meter (98.4-inch) infrared telescope and interviewed a variety of SOFIA experts.

On hand to answer numerous questions were SOFIA scientists Tom Roellig and Eric Becklin, as well as SOFIA science project manager Ed Austin and astronomer Dana Backman of the SOFIA Education and Outreach Office.

The story of SOFIA's visit received widespread news coverage. The next day, articles and photographs played prominently in the Mercury News, San Francisco Chronicle and Palo Alto Daily News. The story also aired on KGO-TV Channel 7, KPIX-TV Channel 5 and KNTV-TV Channel 11, as well as on both KCBS and KGO news radio stations.



NASA photo by Jon-Pierre Wiens



Next up were local dignitaries and community leaders, who also were provided tours of the aerial observatory. Then it was the Ames employees' turn.

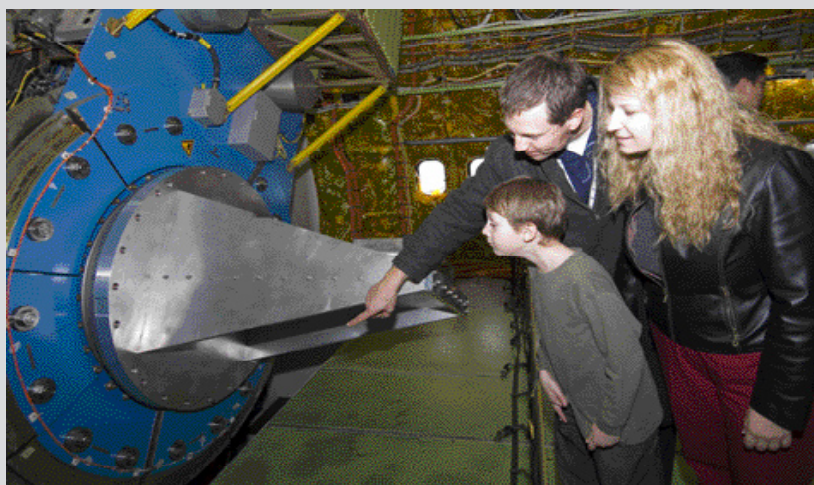
Employees lined up patiently, awaiting their turn to tour the aircraft. As the afternoon progressed, the crowd grew even larger. By the end of the day, NASA officials estimated 3,500 people came to see and photograph SOFIA.

Eventually, the line snaked from the aircraft through the lobby of Bldg. 158 through the parking lot and back to the flight line, as more people showed up for the historic occasion.



NASA photo by Bill Moede

SOFIA landing at Ames on Jan. 14, 2008.



NASA photo by Jon-Pierre Wiens

Visitors check out the SOFIA aircraft during its visit to Ames.



NASA photo by Eric James

Astronomer Dana Backman of the SOFIA Education and Outreach Office speaks with visiting VIPs during the SOFIA stopover at Ames Research Center.



NASA photo by Jon-Pierre Wiens

Thousands of visitors consisting of Ames employees with their families and members of the public and news media came to see SOFIA during its recent visit to the center.

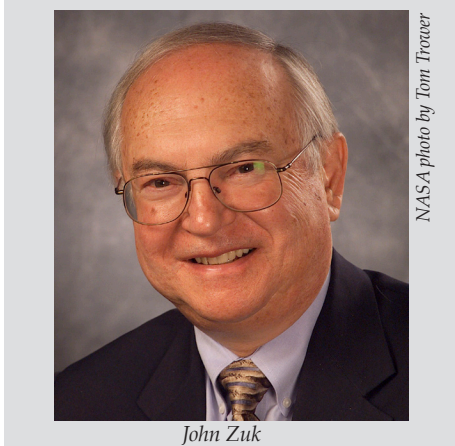
Event organizers hailed the visit a huge success, made even more memorable by the historical significance of the occasion. Positive comments were heard many times by those who got a chance to see SOFIA for the first time, as well as those who had worked on the project over the years.

The next day, SOFIA departed Moffett Field to return to its home at Dryden's newly established Aircraft Operations Facility in Palmdale, Calif., where it will be based during additional development, flight testing and its operational lifetime.



*In memory of...***John Zuk, an aeronautical engineer/inventor at Ames**

John Zuk, an aeronautical engineer at NASA Ames whose research and studies laid the groundwork for commercial helicopter and tiltrotor short haul commuter applications, passed



NASA photo by Tom Traver

John Zuk

away on Jan. 6, 2008. He was a resident of San Jose.

Zuk was employed at NASA from 1965 until his retirement in July 2007. Most recently, Zuk was the Extreme Short Take Off and Landing (ESTOL) Vehicle sector manager for the Vehicle Systems Program of NASA. The ESTOL Vehicle Sector strategically directs project activities for near-vertical takeoff and landing research and development.

He was born on Oct. 30, 1938 in Westhampton, Long Island, New York and attended Westhampton Beach High School. He graduated from Ohio State University with a bachelor of mechanical engineering in 1961 and later earned a master of science in mechanical and aerospace sciences from the University of Rochester in 1965.

Upon graduation, Zuk joined NASA Lewis (now Glenn) Research Center as an aerospace engineer specializing in propulsion research where he remained until 1977, when he transferred to NASA Ames. During his tenure at NASA Lewis, Zuk also earned a doctorate of engineering from Case Western Reserve University in 1972.

At Ames, Zuk had extensive experience in a wide variety of aeronautical vehicles including helicopters, tiltrotors, powered lift and subsonic aircraft. Prior to becoming the ESTOL Vehicle Sector manager, Zuk served as chief of the Advanced Tiltrotor

Technology Office and concurrently as manager for the Short Haul Civil Tiltrotor Project of the NASA Capacity Program at Ames.

Zuk's career spanned the full spectrum from research investigator, system studies performer, branch and office chief, to technical, project and program management. He was an active member of the American Helicopter Society, AIAA (American Institute of Aeronautics and Astronautics) and the Society of Automotive Engineers.

During his government career, Zuk received numerous awards including the Collier Trophy Award as a team member of the Industry/NASA Propfan team, the Research and Develop-

ment 100 Award and the NASA 2000 Turning Goals Into Reality (TGIR) Award for tiltrotor noise reduction, to name just a few. Zuk is the author of 48 technical publications and is a co-inventor of an environmentally friendly anti-icing Q fluid.

He is survived by his wife of 25 years, Maureen, and his two daughters Barbara Boissevain-Villela and Melanie Moya. He has five grandchildren, Sophia, Giselle, Sylvia, Cielo and Luc.

The funeral mass was held in Long Island, New York, followed by interment at Westhampton Cemetery.

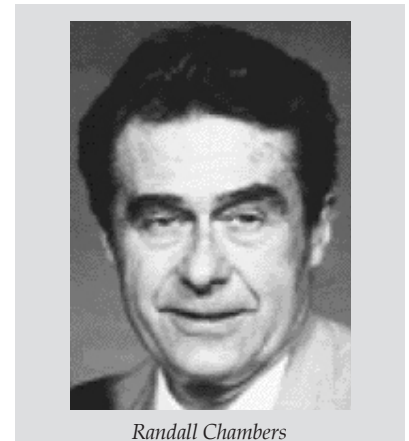
In lieu of flowers, Maureen requests donations be made to charities in memory of John Zuk.

**Randall Chambers, a lead authority in space human factors**

Randall Marion Chambers, 80, died suddenly Dec. 6, 2007. Chambers, a true space pioneer, was one of the world's leading authorities in many areas of space human factors research. He helped NASA develop and implement astronaut training programs for the Mercury, Gemini and Apollo missions, and worked on the human factors and life support systems of Skylab and the space shuttle.

After receiving a Ph. D. from Case Western Reserve University in 1954, Chambers served in the U.S. Air Force. While at the U.S. Navy Aviation Medical Acceleration Laboratory of the Naval Air Development Center in Johnsville, (Warminster) Pa., from 1958 to 1968, he directed the development of countermeasures for crew operations under the hypergravity conditions of launch and re-entry, notably having trained the original Mercury 7 astronauts how to perform in such environments.

Chambers served as chief life scientist and head of human factors engineering at NASA Langley Research Center from 1968 to 1972, when he joined the faculty of Georgia Tech. Upon leaving Georgia Tech in 1977, he continued conducting important human factors research at the Army Research Laboratories in Lawton Okla., until 1980, and then in Washington D.C. until 1988.



Randall Chambers

Chambers had a second academic career as a distinguished professor of industrial engineering at Wichita State University, beginning in 1988. He was the author of several hundred scientific articles, and with his wife, Mary Jane, was co-author of a book about the early space program, "Getting Off The Planet," published by Apogee in 2006.

Over his long and distinguished career, Chambers received numerous awards and honors for his work. He was a fellow of several scientific organizations, including The American Psychological Association, the Human Factors and Ergonomic Society, the American Association for the Advancement of Science and the Washington Academy of Science.

## Ames 'GREEN' team drives down 'green highways and skyways'

BY DEBORAH 'ROBIN' CROFT

Alternatives to dependence on fossil fuels to power personal vehicles and public transportation systems were among the topics discussed during an 'green transportation' seminar entitled, "The Future of Transportation, What's NASA's Role?" held at Ames in January.

Sponsored by the Global Research into Energy and the Environment at NASA, (GREEN), the conference featured presentations by several noted experts in the field of evolutionary transportation technology.

Fred Keeley, chair of the Santa Cruz Transportation Task Force, discussed governmental policy challenges for "Green" Transportation. Michael D. Jackson, senior director for Transportation Technology, TIAX LLC, demonstrated a technology roadmap for achieving

California's emission reduction goals. Jackson illustrated how the use of various bio-fuels, such as corn, sugar cane, methane and other products, could be used to propel vehicles and reduce air pollution.

Christopher Perkins, co-founder of Unimodal Systems, a company that is developing an alternative rapid transportation network powered by a series of magnets along a track throughout a city. The system resembles a subway comprised of individual pods that can carry up to two people. The pods are suspended from elevated tracks and can be self-propelled off the main highway track to transfer to local stops. According to Perkins, "the idea is to eliminate the use of cars in urban areas. Infinite cars and gas will result in infinite congestion." So, even if the price of oil significantly comes down, cities will still be plagued by gridlock.



NASA photo by Dominic Hart

A GREEN seminar entitled 'The Future of Transportation: What's NASA's Role?' was held at the center in mid January. The seminar featured presentations by noted evolutionary transportation technology experts.

## Ames/South Korea collaboration

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Institute of Science and Technology to advance future space exploration," Worden added.

"I am delighted with this outcome. This potential collaboration is a historic event for KAIST as well as for NASA Ames," said Suh.

KAIST's research team, led by professor Soon-dal Choie, launched Korea's first small satellite 'Uribyeol 1' in 1992. Since then, Korea has launched 10 small satellites. The most advanced of these, Arirang 2, began operations in July 2006, and can distinguish objects as small as 39.37 inches (one meter) wide on Earth's surface.

KAIST, established in 1971, currently has 442 professors teaching approximately 8,000 students. Located in the Daedeok Research Complex 90 miles south of the capital city of Seoul, KAIST has eight research institutes specializing in bio-engineering, information technology, eco-energy and selected interdisciplinary areas.

## Ames celebrates its 68th birthday



NASA photo by Dominic Hart

On Dec. 20, 1939, ground was broken for the Ames Aeronautical Laboratory. Ames personnel have been accomplishing great things ever since. Ames employees were invited to celebrate the center's birthday with a slice of cake at lunchtime in the Ames Mega Bites Cafe on Dec. 20, courtesy of the Ames Exchange. Jack Boyd, senior advisor to the center director (right), discusses Ames' history with an Ames employee at the cake-cutting event.



## 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 Nov), from 12 p.m. - 1 p.m., Bldg. N-262, Rm. 100. URL: <http://sail.arc.nasa.gov/>. POC: Becky Hooey, ext. 4-2399.

## 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 2007 Jan. 1, 2007 - Dec. 31, 2007

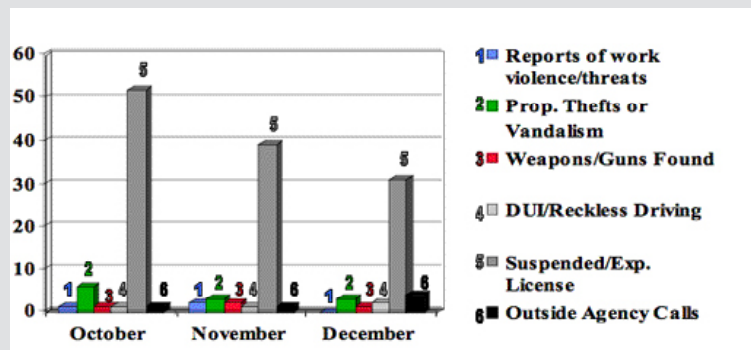
	Civil Servants	Contractors
First aid cases	13	15
Lost Workday cases	0	2
Recordable cases	2	4
Restricted duty days	0	2

Above data are as of Dec. 31, 2007. May be subject to slight adjustment in the event of a new case or new information regarding an existing case.

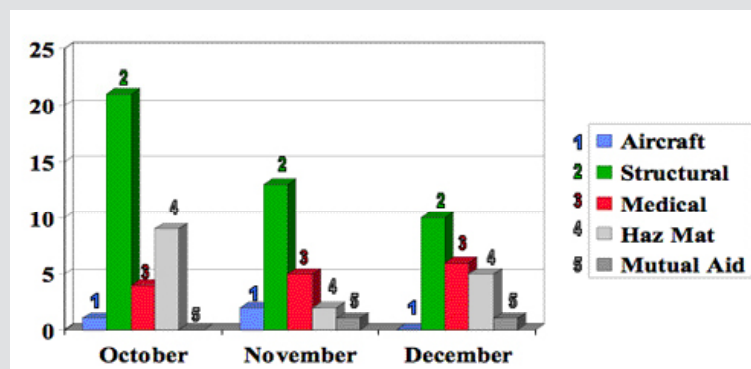
## Protective Services monthly activity

A statistical summary of activities of the Protective Services Division's Security/Law Enforcement and Fire Protection Services units for the month of December 2007 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!

### Transportation

'95 Toyota Camry, emerald green exterior, 4dr, 5-speed manual transmission. 187,500 miles, great condition, runs smoothly, gives 26mpg, has recent smog certificate and complete maintenance records since 1995! \$3,000. Anupa (650) 862-2869

### 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.

Wooden desk and chair sets (2) like new. For children (ages 3 - 11). \$30 each. Call (408) 425-8081.

## PM Challenge speaker schedule is available

The Fifth Annual NASA Project Management (PM) Challenge speaker schedule is now available at: <http://pmchallenge.gsfc.nasa.gov/program.htm> Be sure to register at: <http://pmchallenge.gsfc.nasa.gov/registration2008.htm>

### For All Your Supply Needs On Installation

NASA Ames Supply Store • Building N255 • DeFrance Ave. (North Side)

Huge In-Store Selection  
50,000 Catalog Items  
FREE on Installation Delivery



- Office Products
- Paper
- Paper Products
- Janitorial & Cleaning Supplies
- Computer Accessories
- Furniture & Tools



Retail Store  
650-604-6801 • Fax 650-604-6802  
On-Line  
[www.aibexpress.com](http://www.aibexpress.com)

Approved Installer for the West (JWOD) and NE Member

### The NASA Lodge

Rooms starting at \$45 a night.

<http://ncccenter.arc.nasa.gov/lodging.html>

Having a B-I-G family reunion and just run out of bedrooms and inflatable beds? Reserve rooms at the NASA Lodge

Ames employees and contractors can "host" their friends or relatives at the Lodge, and it doesn't have to be government or NASA related.

Let Us Welcome You!

Call (650) 603-7101

## 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 bldg. 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](mailto: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.

## Astrogram deadlines

Please submit articles, calendar and classified advertisements to [astrogram@mail.arc.nasa.gov](mailto: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.



# Scientists make voyage over Arctic to study meteor shower

continued from page 2

Quadrantid orbits have accumulated over time, which also depends on the age of the shower and how the stream was created. Like most of our meteor showers, the stream appears to have been created in a breakup, instead of a slow and gradual oozing out of water vapor. The massive stream can not be much older than 500 years. In 1490-91 A.D., Chinese observers reported a comet moving in the same plane as that of the Quadrantids. We are investigating whether comet C/1490 Y1 represents the moment in time the Quadrantid parent body broke and created the massive stream. In 2003, we discovered that a minor planet called "2003 EH1" moves among the meteoroids. This now dormant remnant of the breakup provides justification to investigate the origin and evolution of the stream. The current models that predict how the stream will manifest 500 years later are insufficient, which is why we also made an effort to collect other evidence into

the origin of the stream. We measured spectra for the main element composition of the dust, light curves to investigate how the grains break upon entering the atmosphere, and meteoroid size distributions

to understand the fragmentation processes during formation of the stream.

The mission unfolded as planned due to the tremendous support and generous contributions received. The Quadrantid MAC team thanks all that made the mission possible. Once we have figured out what happened in the 2008 Quadrantid shower, we all hope to do



NASA photo by Eric James

Dave Holman (left) and Robin Gray (right), experienced meteor observers, count Quadrantid meteors by clicking a computer mouse while watching a video taken by one of the cameras filming meteors out the windows of the aircraft. Their tally was used to measure the meteor shower's peak in near-real time.

this again some time in the future.

First impressions, images and predictions are posted at: <http://quadrantid.seti.org>

Editor's note: Peter Jenniskens is the principal investigator for the Quadrantid shower mission.

# Ames HAZMAT team conducts hazardous waste spill drill

The Ames HAZMAT team conducted an emergency drill on Jan. 18 at the center. A mock hazardous waste scenario was created with emergency services personnel taking care of the 'victims' at the scene.



Top left photo: Dr. David Kaye (right) and Teri Castrejon work to save the accident victim who allegedly had a heart attack.



NASA photos by Dominic Hart

Above: Firefighters work to rescue a victim (a dummy) in need of medical help during the recent HAZMAT drill.



Above photo: Alan Dunn and Erik Rockwell from the Environmental Office meet with David King to discuss response options during the drill.



Above photo: Mark Washington (right) from Safety Office discusses with security officer Robert Dean the emergency and how best to investigate the accident.

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

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

Managing Editor.....Michael Mewhinney  
 Editor, Layout and Design.....Astrid Olson

You can reach the Astrogram Office at: [astrogram@mail.arc.nasa.gov](mailto:astrogram@mail.arc.nasa.gov) or by phone at (650) 604-3347.  
 Astrogram Web site: <http://www.nasa.gov/ames/astrogram>.