THE AMES Astrogram
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
AMES RESEARCH CENTER, MOFFETT FIELD
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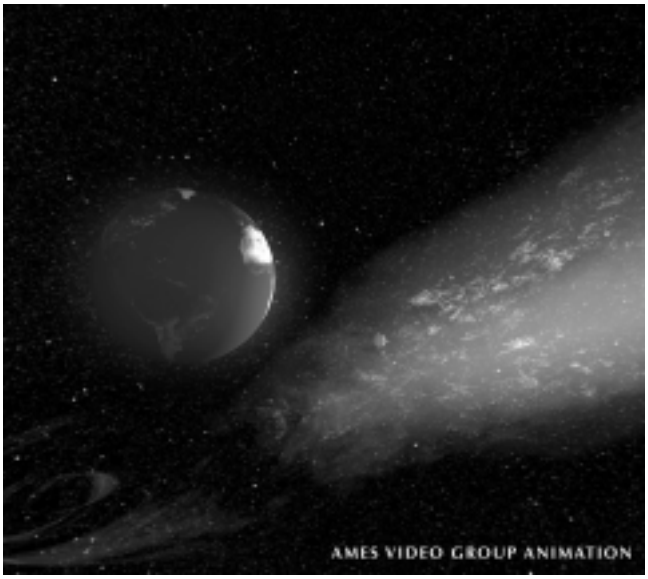
on-line@http://ccf.arc.nasa.gov/dx/

Ames' first Astrobiology mission studies Leonid firestorm over Okinawa

Name the body that gets a good shower only once every 33 years. The answer, of course, is the planetary body Earth. And the shower is debris from the comet Tempel-Tuttle that strikes our atmosphere as Leonid meteors during the comet's long-period orbit around the Sun.

Recently, Ames scientists made an unprecedented attempt to study "the Leonids" from a unique vantage point. Two research aircraft and a handful of jetlagged scientists were sent aloft over Okinawa to chase the meteor storm whose arrival time, like that of a newborn baby, could only be projected. This first-ever Ames operational astrobiology mission was an ambitious, high-risk, high-stakes undertaking. But the results made all the hard work worthwhile. The meteors streaked; the airborne scientists reaped a wealth of exciting new data; and, all the while, the story was creating a media meltdown from Sydney to New York.



The first obstacle the scientists encountered was a curve ball tossed by Mother Nature — the just-short-of-a-storm meteor shower arriving over 14 hours earlier than predicted. The result was that it peaked over Northern Europe, rather than Asia and the Pacific. Nonetheless, the mission was a complete success, according to principal investigator Peter Jenniskens, an astronomer at the Search for Extraterrestrial Intelligence (SETI) institute in Mountain View.

"All onboard instruments were fully operational," Jenniskens said. "The mission made 30 lidar detections of meteors and recorded a substantial number of high-definition television images of bright fireballs and enduring meteor trains. The mission was all that we could have hoped for," he concluded. "It validated the concept of using an airborne platform flying above the clouds to study such a meteor event."

According to Jenniskens, scientists onboard saw evidence of a meteor shower, but no storm, with peak "flux" rates of 200-300 meteors/hour, approximately twenty times higher than normal. The highest meteor count, however, at some 2,000 meteors per hour was reported farther west over the Canary Islands.

Two years in the planning, the NASA Ames and SETI co-sponsored Leonid encounter mission brought together a team of interdisciplinary scientists (including astronomers, atmospheric physicists and meteor specialists) who used state-of-the-art sampling techniques to study Tempel-Tuttle's blaze of cometary debris. The two research aircraft, based at Kadena Air Force base in Japan, provided three-dimensional viewing. They used a broad array of scientific instruments to record high-resolution stereoscopic images and capture critical spectrographic data about the meteors' dynamics and chemistry.

One aircraft was a modified L-188C Electra from the National Center for Atmospheric Research in Boulder, CO, sponsored by the National Science Foundation. That aircraft served as the mission "spotter" and recorder. The airplane carried a two-beam Lidar, a type of radar with light pulses that measures the altitude of neutral atom debris in the meteor trails. Other instruments on the Electra included airglow recorders, visible wavelength imagers and high-definition TV cameras. The Electra flew at an altitude of 22,000 feet, just above the cloud cover.

The second aircraft, a U.S. Air Force-owned FISTA (Flying Infrared Signatures Technology Aircraft) from Edwards Air Force Base, CA, carried researchers who used its upward-looking portholes to observe the meteors. The aircraft also carried imagers and infrared and visible light spectrometers to dissect the meteors' light in search of their fingerprint of atoms and molecules. The FISTA aircraft flew as high as 39,000 feet in order to rise above the lower atmosphere's water vapor layer.

When the Earth crosses an especially dense concentration of the dust and debris left by comet Tempel-Tuttle, a Leonid meteor storm results—"shooting stars" streaking through Earth's upper atmosphere at rates as high as thousands per hour. The Leonids provide a spectacular "light show" for parts of the world, the location depending upon the time of peak activity.

"The central theme of this mission was astrobiology," said Jenneskins. "We were especially interested in learning the composition of Tempel-Tuttle's debris, the

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see related story on page 3

Ames ISO Web-site address: http://dqa.arc.nasa.gov/iso9000

NASA web site highlights Wright Flyer replica safety studies

While NASA engineers study how wind flows around a full-scale model of the 1903 Wright Flyer to ensure that a safe flying replica will be built, hundreds of classrooms will get NASA wind tunnel test data about the model in almost real time via the Internet at http://quest.arc.nasa.gov/aero/wright.

Called Wright Flyer Online, the NASA educational web site permits students to conduct real-time science. In March 1999, a model of the 1903 aircraft, the first to make a successful powered and piloted flight, is scheduled for tests in the world's largest wind tunnel complex at Ames. The tests will ensure that a replica to be built by a non-profit institute can safely be flown by a pilot on Dec. 17, 2003, the hundredth anniversary of Orville and Wilbur Wright's first flight.

"The Wright brothers did not have access to such a modern, computerized wind tunnel," said Susan Lee, aero design team online project manager at Ames. "So, through these wind tunnel tests, engineers will document the flight characteristics of the first real airplane."

To increase the still-to-be-built second replica's reliability, engineers want to improve the Wright Flyer's design. Project engineers will study the test model's stability, control and handling at speeds up to 30 mph in Ames' 40-foot-by-80-foot wind tunnel. Test results will be used to compile a historically accurate aerodynamic database of the Wright Flyer.

"To prepare students for the wind tunnel tests in March, we already have many online educational activities, including chat sessions with Ames engineers, pictures of the airplane model and an email question-answer service," Lee said. "One of our purposes is to give students opportunities to learn the history of the Wright Brothers who pioneered early flight; we also want to teach young people how engineers study airplane flight to improve it."

A teachers' guide for grades 5 through 12 is available to educators and the general public on the web site. "There will be a couple of collaborative projects where classroom students will work with other classrooms through the Internet. One project, for example, is to improve the design of a glider," Lee said.

The objective of the projects is to enrich and expand student understanding of the scientific and engineering principles behind NASA work and to encourage classrooms across the globe to communicate. Each project has clear goals, and students can interact with NASA experts, project staff and other classrooms.

"Games, puzzles and contests are also a part of the online web site," said Ames multimedia education specialist Bonnie Samuelson of the External Affairs Office. "The site is fun, and students learn about aeronautics."

"An important focus of what we are doing in this project is the use of technology in education," she added. "This focus is one of the primary educational goals of Vice President Gore."

"President Clinton and I have launched an initiative to make technology a powerful tool for teaching and learning in our nation's schools," Gore wrote in a recent memorandum. In the memo, he also noted that students will be able to follow wind tunnel tests of the Wright Brothers' full-scale airplane model conducted at Ames.

The test model was built by a team of volunteers from the Los Angeles section of the American Institute of Aeronautics and Astronautics (AIAA), using precise plans from the original airplane provided by the Smithsonian Institution. The model features a 40-foot-4-inch wingspan reinforced with piano wire, cotton wing coverings, spruce propellers and a double rudder. In the wind tunnel, the model will be powered by a NASA electric motor.

"I can't think of anything as exciting as using modern technology to test a replica of the biplane that Orville and Wilbur Wright flew for the first time ever in 1903 at Kitty Hawk," said Pete Zell, Ames' wind tunnel test manager. "NASA is here as a resource for the public and to inspire young people. This project seeks to educate and inspire youth; it's much more than dollars and cents."

Using the resulting wind tunnel test data, the second Wright Flyer, a replica, will be built by AIAA volunteers and flown on Dec. 17, 2003, at Kitty Hawk, NC. During the recreation of the Wright Brothers' first flight, the replica will fly low and travel at only 30 mph, the same speed flown by the Wright Brothers, whose flight only traveled 120 feet during its 12 seconds in the air.

The online educational project continues through the end of the 1998-99 school year. The project is one in a suite of online offerings from NASA's Quest Project at URL http://quest.arc.nasa.gov

BY JOHN BLUCK

Kaufhardt peer awards given

Barbara Young (Code JAC) and Lupe Velasquez (Code JAI) were recognized by their peers for their achievements and accomplishments at an annual ceremony on November 10. Young and Velasquez were presented with the Leslie A. Kaufhardt "peer award" for their contributions to their branches, the JA division, and other Center personnel and customers.

photo by Dominic Hart

Lupe Velasquez (left) and Barbara Young (right) chat at recent Kaufhardt peer awards ceremony.

Young was recognized for her contributions as a dedicated branch reviewer and for numerous procurement accomplishments, particularly in awarding the recent administrative and technical services contract. This was accomplished well within procurement leadtime goals. In addition, Young was recognized for her contributions to continual improvement within the division.

Velasquez was recognized for her many years of mentoring junior specialists, most notably in the simplified acquisition area. She was also cited for her dedicated efforts as a branch team leader, and numerous other administrative duties, such as the implementation of the Outsource Desktop Initiative for NASA (ODIN) at the Center.

The award winners have contributed to improved performance, efficiency, and morale, which has strengthened relationships within the division and with other directorates.

Exercise '98 needs volunteers

The Ames Emergency Operations Center (EOC), is planning an extensive disaster exercise. Emergency teams will need simulated victims for the exercise (moulage will be used in some cases). The exercise will start on Thursday, Dec. 3, through Saturday, Dec. 5. Volunteers will be needed for only a few hours. The exercise will better prepare teams to save lives if there is a real disaster, and the program will benefit everyone at the Ames Complex. If interested in helping by simulating a victim, please contact Carmela Radar at ext. 4-6706.

Center Briefs

Weiler named Associate Administrator for Space Science

On Nov. 16, NASA Administrator Daniel S. Goldin named Dr. Edward J. Weiler Associate Administrator for NASA's Office of Space Science, effective immediately.

Weiler has served as acting Associate Administrator since Sept. 28, following the departure of Dr. Wesley T. Huntress, Jr.

"In his short time as acting Associate Administrator, Ed Weiler has demonstrated both the management skills and scientific leadership that this position demands, and I am delighted he has accepted the offer on a more permanent basis," Goldin said.

NASA technology helps Smithsonian preserve the Star-Spangled Banner

A NASA infrared camera developed to explore Mars will assist the Smithsonian Institution in its three-year project to preserve the Star-Spangled Banner.

The camera, built at NASA's Goddard Space Flight Center, Greenbelt, MD, is taking images this month of the historic flag in infrared light to help preservationists identify deteriorated and soiled areas not obvious to the human eye.

The camera, called the Acousto-Optic Imaging Spectrometer (AImS), was developed by Dr. David Glenar at Goddard.

Considered a national treasure, the Star-Spangled Banner flew over Fort McHenry in Baltimore, MD, during the War of 1812 and inspired the words that became the U.S. national anthem. Despite receiving extra special care at the Smithsonian's National Museum of American History (NMAH), the flag is deteriorating from decades of exposure to light, air pollution and temperature fluctuations.

Stardust mission to harvest comet dust

The Stardust comet sample return mission, scheduled for launch on Feb. 6, 1999, from Cape Canaveral, FL, will meet with Comet Wild 2 ("Vilt-2"), fly through the cloud of gases and dust around the head of the comet and collect particles flying off the nucleus.

The particles will be captured in aerogel, an exotic, jelly-like glass. In 2006, the Stardust samples will parachute to Earth in a clamshell-like reentry capsule and come to rest at a pre-selected spot in the Utah desert.

The tiny particles Stardust brings back will reveal ingredients from the original recipe that made the planets.

ISO 9001 Implementation-- it's all about attitude

After much planning, writing and training, Ames has begun to implement the documented procedures that make up the Quality System. Trying to implement those procedures is the single most effective way to debug them. Internal audits and audits by our ISO registrar, Det Norske Veritas (DNV), are also very effective ways to get expert feedback on our Quality System. These audits are extremely valuable learning tools for Ames, but to show effective operation of our Quality System, the audit results must be documented in formal corrective action requests. This is where attitude becomes critical.

ISO 9001 is an appropriate model for the Ames Quality System. It will allow us to demonstrate that we consistently provide products and services that meet customer requirements. When the decision was made to adopt the ISO model, we committed to a long-term process. During this process, our attitude is important. This is not the time for blame or finger pointing. Now is the time to work together and not compete against each other. In a Quality System, teamwork is important because our system is only as strong as the weakest link in the organization.

John Naber, the Olympic gold medallist featured at Ames during National Quality Month, spoke about competing against yourself rather than against others when working toward a goal. In my previous job as auditor for an ISO registrar, I was asked several times - how are we compared to others? I'd usually answer that getting a grade was not the point. The focus should be on your own Quality System rather than someone else's. If I issued a nonconformance, and they said, "We'll fix it right away; we're really committed to quality," they were missing the point. As an auditor, I wanted to see that they understood the importance of finding the root cause of a problem, so that it would never reoccur.

Focusing on which is the best code or which code has the most corrective action requests (CARs) can defeat the purpose of pursuing ISO 9001 certification. Tracking the numbers in order to identify trends and patterns is important. ISO 9001 requires it. But don't get hung up on the numbers; what's important is that we have a system for tracking CARs and looking for trends, and that appropriate corrective actions are implemented in a timely fashion.

A question such as, "Is this a CAR or an observation?" is the wrong approach. What should matter to us, and what DNV will look for, is evidence that we have taken the time to identify and eliminate the underlying causes of recurring problems. Doing a good root cause analysis, rather than rushing to close a CAR just before an audit, will demonstrate that Ames understands that the corrective action process is critical to long-term improvement of the Quality System. Corrective action requests should be embraced rather than viewed as blemishes. Every CAR is an opportunity to improve the Quality System.

Our commitment to meeting customer requirements will be demonstrated by the sincerity of the personnel who are audited. Rather than quick fixes and colorful presentations, our registrar DNV will seek objective evidence that the Quality System has been logically documented, consistently implemented and verified as effective.

As we continue the implementation process, let's continue to foster an attitude that goes beyond achieving certification. Let's focus on quality in our daily work and a commitment to building and maintaining a strong Quality System--one that will foster customer satisfaction and continuous improvement as part of the culture at Ames.

BY M.E. EGLINGTON

Blood drive set

Give a gift this holiday season, give the gift of life! Take the time to donate on Thursday, December 3. If you elect to participate in the Red Cross blood drive, your gift of life will allow many people this holiday season to experience a new year. Because every unit of blood has the potential to save a life, everyone is encouraged to donate. All medically eligible donors, including contractors, students and civil servants are invited to come to Building 3, the Moffett Training and Conference Center, from 7:30 a.m. to 3:30 p.m.

To schedule an appointment, go to the web site: http://dq.arc.nasa.gov/dqh/blooddonation.htm-- click on Register Now To Give Blood; choose a time slot, and you are done.

For more information on the blood drive or on bone marrow donation processes, contact Chaz Czaplicki at ext. 4-6942.

Acquisition Division recognizes COTRs of the Year

The Acquisition Division officially recognized the Contracting Officer's Technical Representatives (COTRs) of the Year for fiscal year 1998 in a ceremony held at the Center on November 12. Each of the acquisition branches honored an individual with whom it works closely and whose diligence in performing the COTR function makes a significant contribution to the successful acquisition of goods and services in support of the Center's mission.

photo by Dominic Hart

COTR of the year award recipients from left to right: Charles W. Duff, Suzanne Zabor, John J. Adams (back), Kinga Perlaki (front) and Geoffrey S. Lee.

The Acquisition Branch for Center Operations and Space recognized John J. Adams, Code JIR, for his outstanding support to the Center for reproduction and copier systems; Nancy D. Searby, Code SLR, for her technical management of the Cell Culture Unit; and Geoffrey S. Lee, Code DX, for his support to the Grants Office, especially in the Minority University Research and Education Program. The Acquisition Branch for Information Systems recognized Suzanne Zabor for her outstanding support provided in the area of simplified acquistion procedures. The Acquisition Branch for Aeronautics recognized Kinga Perlaki, Code YBH, for her excellent technical oversight on several contracts for rotorcraft analysis and simulation research.

Charles W. Duff II, Chief, Acquisition Division, presented the awards to the five awardees.

Leonid firestorm over Okinawa

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molecules that were created during the meteors' interaction with Earth's atmosphere, and the composition and chemistry of the atoms, molecules and particles detected in the meteors' path. We hope this will help us understand how extra-terrestrial materials may have helped create the conditions on Earth necessary for the origin of life. The mission also sought clues about how biogenic compounds formed in stars are eventually incorporated into planets," he said.

Scientists hope to learn how a meteor's mass compares to its brightness and to the mass of its parent comet. Currently, they can only guess how much material enters the atmosphere during a meteor bombardment. Leonid researchers will compare the meteor images they captured with information from the dual Lidar to provide an indication of the chemical evolution of the meteor debris.

Jenniskens compared the 1998 activity to the Leonid meteor shower of 1965, which was followed by another major storm one year later. "Perhaps we will see a similar pattern in 1999," he surmised. He hopes to get funding for another meteor interception mission next November when the Earth's orbit will again intersect a highly concentrated dust cloud in the wake of Tempel-Tuttle. Science results from the Leonid mission will be announced in April 1999 during a two-day workshop at Ames.

Ames collaborated in the international Leonids effort with the SETI institute. Instruments were contributed by the University of Illinois at Urbana; the Aerospace Corporation; the Air Force Research Laboratory; the Japanese Broadcasting Company (NHK); Kobe University, Japan; the Ondrejov Observatory (Czech Republic); Mt. Allison University (Canada); the SETI Institute; and the University of East Anglia, England.

In addition to the fantastic scientific return from the mission, the Leonids generated a large volume of public and media interest. The Chabot Observatory and Science Center in Oakland reported that, despite the cold, nearly 500 people attended its predawn viewing event; and reporters from around the world called Ames to interview Ames scientist Dr. Dale Cruikshank and Professor Jack Baggaley from New Zealand about satellites and steps taken by NASA and other organizations to avoid the danger posed by the shower. During the peak of activity, controllers at NASA's Goddard Spaceflight Center, Greenbelt, MD, changed the orientation of 22 spacecraft to reduce the possibility that a tiny Leonid particle (of 1 to 100 microns, about the size of a small grain of sand) might strike and disable a spacecraft.

Did this close-up experience with the Leonids satiate Ames scientists' desire to learn more about meteors? Not at all! "Although it may prove to be the experience of a lifetime," Jenniskens exulted recently, "I can hardly wait till next November to go and do it again!"

Note: additional information and images of the Leonid meteor shower can be found on the net at the following website addresses:

http://leonid.arc.nasa.gov
http://leonids.arc.nasa.gov
http://quest.arc.nasa.gov/meteor
http://www-space.arc.nasa.gov/~leonid/ http://www-space.arc.nasa.gov/~leonid/

BY KATHLEEN BURTON

First ISS element launched successfully

"One down, 44 to go!", noted NASA Administrator Dan Goldin from Kazakstan when the first component of the International Space Station launched flawlessly at 1:40 a.m. EST on Nov. 20. A Russian proton rocket placed the Zarya control module into orbit where the spacecraft will await the arrival of Unity, the first US element of the ISS that is a connecting node to be delivered by the crew of Space Shuttle mission STS-88. That mission will lift off from the Kennedy Space Center on Dec. 3. To find out how Ames is contributing to ISS, visit the Biological Research Project home page at http://spaceprojects.arc.nasa.gov/Space_Projects/SSBRP/index.html.

ACE is a success

Ridership on the Altamont Commuter Express has increased 10 percent since its first week of operation. The train runs twice in the morning from Stockton down to San Jose and twice in the evening from San Jose to Stockton. Bicycles are welcome on the trains, and free shuttle service, the "Blue Shuttle," is provided between Ames and the Great America station. Contact Amanda Dunham, ACAP manager, at ext. 4-6896 for schedules. Janine Ciffone, Ames Exchange financial officer, at ext. 4-4948, has information on the Ames transit subsidy. For additional information on ACE, look up www.acerail.com, or call 1-800-411-RAIL. For Blue Shuttle information, go to www.vta.org, or call (408) 321-2300.

Residents of some areas of Contra Costa County who ride the County Connection 920 ACE Express may be eligible for special ACE passes. Contact Lisa Sanchez, transportation analyst, City of San Ramon at (925) 275-2296 to see if you qualify.

Volunteer mentors needed

NASA Ames Research Center and the YWCA will host TechGYRLS Day on Saturday, January 23, 1999 at the Moffett Training and Conference Center.

The event will involve girls ages 9 - 13 in activities designed to entice, encourage and challenge them to explore new ideas about technology.

An important part of TechGYRLS day is connecting the participating girls with women scientists, engineers and other professionals working in diverse fields of technology.

If you would like to be a mentor for TechGYRLS Day, please contact Tina Herrera at ext. 4-2520, or email her at: therrera@mail.arc.nasa.gov; or contact Lisa Marie Gonzales at ext. 4-2046 or email her at: lmgonzales@mail.arc.nasa.gov.

photo by Dominic Hart

Dr. Henry McDonald and Kate Mitchell, President and CEO of Live Picture, Inc. Dr. McDonald is looking at the visualization system that is on the Marsokhod.

MOU signed with Live Picture

Ames Research Center signed a memorandum of understanding with Live Picture, Inc. on September 3. A formal signing ceremony commemorating the event was held on October 26.

Ames is looking at potential R&D collaborations with Live Picture, Inc., a small Silicon Valley company producing leading-edge Internet imaging technologies. Ames has over 185 current collaborations with external organizations in the information technology area. Ames continues to aggressively pursue collaborations with external entities to increase the leverage of NASA's research investment.

NAAC luncheon held

The Native American Advisory Committee (NAAC) teamed with Lockheed Martin and Onizuka Air Force Base to sponsor the Native American Heritage Month luncheon held at Lockheed Martin Missiles and Space on November 4.

Ronald J. Pinkham was keynote speaker at the luncheon. He is a descendant of Chief Joseph of the Nez Perce tribe.

Native American dancers entertain at the recent heritage luncheon festivities.

Ronald J. Pinkham speaking at the Native American Heritage luncheon held recently at neighboring Lockheed Martin.

photos by Dominic Hart

Ames launches first sounding rocket in 20 years; flight is extremely successful

Video frame shows experiments ejecting from sounding rocket. The first ejection was the scramjet flight dynamics experiment.

Dramatic, live television pictures of the ejection of 11 separate hypersonic flight experiments recently were taken during the 20-minute suborbital flight of a small NASA rocket. The images were seen on NASA TV and by classrooms connected to the Internet before, during and after a launch Sept. 18. Liftoff was from Launch Complex 36 at the White Sands Test Facility, NM. This was the first time that Ames flew a sounding rocket in more than 20 years.

The key objective of the low-cost payload was to perform multiple, inexpensive hypersonic (Mach 7-plus) flight experiments. They were conducted to develop and test candidate technologies for next generation planetary exploration missions and to study general problems associated with high speed flight.

"We call this test method a 'wind tunnel in the sky,'" said Marc Murbach, research scientist in the Space Projects division. He explained that, instead of using a wind tunnel to simulate re-entry, sounding rockets can be used to conduct multiple flight experiments. Wind tunnels are chambers through which air flows during tests of airplane and spacecraft shapes. In the tunnels, air is blown around airplane and rocket models to simulate flight. The flight experiments can provide unique data that can't be gathered using ground facilities.

"We wanted to develop a generic 'facility' that would allow an easy accommodation of different sorts of experiments,' Murbach said. "The key to performance of the multiple experiments inexpensively is that a transmitter wasn't used to send data back to us during flight," he said. "Each of the experiments parachuted to the ground; they were later recovered to get the data."

"The experiments worked extremely well," according to Murbach. "We obtained very good flight data," he said.

"For one thing, we are learning how to use hypersonic decelerators to slow planetary entry vehicles. One of our decelerator devices is deployable and is conical in shape." He explained that this may eventually lead to rethinking how planetary entry vehicles are designed. An example is the possible design of a stable Mars entry vehicle that would still be 'skinny,' but could accommodate a large, capable rover.

One of the 11 experiments was the full-scale Pascal Probe. It is a key element of an inexpensive Mars Network mission recently proposed by Ames to deliver 24 surface pressure stations to the Martian surface. These stations are small, cylindrical surface landers intended to gather science and atmospheric data on Mars. "We were happy that, due to the modularity of our experiment design, we were able to perform a full-scale sub-orbital flight test within a very short time," said Murbach.

Two-stage sounding rocket (Terrier-Black Brant) preparing for launch at White Sands, New Mexico.

In addition to the 'conventional' 70° cone design, the recent launch also tested an advanced probe concept ejected from one of the other bays.

"In this case, most of the drag experienced by the probe was to the rear, making the probe more stable. Initial data returns show that it was, indeed, more stable, with the additional advantage of lighter weight and less mechanical complexity," said Murbach.

Another experiment involved a sample return vehicle concept. This came about when Ames scientists were discussing problems associated with the proposed Champollion mission, said Murbach. The intent was to modify a traditional probe, but make it more stable with a deployed stabilizer. In addition, no parachute was used during final descent. "We weren't sure if the data system or beacon were going to survive entry without a parachute. We were pleasantly surprised when they did."

In one of the more interesting experiments, a transpiration cooling system was demonstrated. This is a system by which a fluid is injected or 'transpired' into the stagnation region of an entry vehicle. When this happens, the local heating rate can drop dramatically. "We sometimes jokingly call this a 'liquid heatshield,' " said Murbach. What is unique about the system is that it is self initiating, and gets around the problem of electronic controls and valves. "We used bicycle parts and kept the design very simple," he said.

A scramjet concept was also flight tested.

ARC sounding rocket crew: Back row, left to right: Al Gutierrez, Rick Wittrock, Malyn Wells, Marc Murbach (PI). Front row, left to right: Jerry James, Garret Nakashiki, Mike Jones, Rob Tragesar and Mike Guerrero.

A scramjet is a supersonic combustion ramjet (that has been studied for a long time) but is very difficult to develop using only ground facilities. "The purpose of this test was to determine if we could develop a system to study fluid physics relatively cheaply," said Murbach. "We are now analyzing the data to see how well the stabilization system worked, " he said.

"One of the most rewarding parts of the experience was working with the extremely competent teams that we developed both at Ames and at Wallops, " said Murbach. "We ran the project in a true 'skunk-works' fashion--everyone contributed. This was not only fun, but necessary, since our funds were limited to $60,000 in developing the payload."

Participating organizations included Ames; NASA Wallops Flight Facility, Wallops, VA; the Jet Propulsion Laboratory, Pasadena, CA; Stanford University, Palo Alto, CA; and several public middle and high schools that participated remotely via the internet.

The telescience Internet address is: http://www.wsmr.army.mil/nro_a/WEB/mainweb.html

BY JOHN BLUCK

Calendar

Jetstream Toastmasters, Mondays, 12 noon to 1 p.m., N-269/Rm. 179. Guests welcome. POC: Jenny Kahn at ext. 4-6987 or Pam Walatka at ext. 4-4461.

Ames Bowling League meets at Palo Alto Bowl every Tuesday at 6 p.m. The league is in need of substitute bowlers. POC: Mina Cappuccio at ext. 4-1313.

Ames Ballroom Dance Club, No lessons in December, will resume January 5th with Beginning and Intermediate East Coast Swing, Tuesday's from 5:15-6:30. Moffet Training and Conference Center, Bldg. 3 in the Showroom. POC: Deb Narasaki at email: dnarasaki@mail.arc.nasa.gov. New ABDC website: http://arcapps.arc.nasa.gov/Info/BallroomDance/Welcome.Htm

Ames Child Care Center Board of Directors Meeting, Wednesdays, 12 noon to 1 p.m., N-213/Rm. 204. POC: Debbie Wood at ext. 4-0256.

Ames Contractor Council Meeting, Dec 2, 11 a.m., N-200/Comm. Rm. POC: Greg Marshall at ext. 4-4673.

Hispanic Advisory Committee for Employees, Dec 3, 11:45 a.m. to 12:30 p.m., N-239/Rm. 177. POC: Carlos Torrez at ext. 4-5797.

Environmental, Health & Safety Monthly Information Forum, Dec 3, 8:30 a.m. to 9:30 a.m., Bldg. 19/Rm. 1078. POC: Linda Vrabel at ext. 4-0924.

Ames African American Advisory Group Meeting, Dec 3, 11:30 a.m. to 12:30 p.m., N-241/Rm. 237. POC: Mary Buford Howard at ext. 4-5095.

Nat'l Association of Retired Federal Employees, S.J. Chapter #50, Meeting, Dec 4, at the Elk's Club, 44 W. Alma Avenue, San Jose. Social hour: 10:30 a.m. Prog. & bus. mtg. follow lunch at 11:30 a.m. POCs: Mrs. Leona Peery, Pres., (650) 967-9418 or Earl Keener, Public Relations, (408) 241-4459.

Southbay FEW Chapter Meeting Dec 8, 11:30 a.m. to 12:30 p.m., Bldg. 241, Rm B2. POC: Christine Munroe at ext. 4-4695.

Professional Administrative Council (PAC) Meeting, Dec 10, 10:30 a.m. to 11:30 a.m., Location TBD. POC: Janette Rocha, ext. 4-3371.

NFFE Local 997 Union General Meeting, Dec 16, 11:30 a.m. to 12:30 p.m., Bldg. 19/Rm. 1040. POC: Marianne Mosher at ext. 4-4055.

Ames Asian American Pacific Islander Advisory Group Meeting, Dec 17, 11:30 a.m. to 1 p.m., N-241/Rm. B2. POC: Daryl Wong at ext. 4-6889 or Brett Vu at ext. 4-0911.

Ames Amateur Radio Club, Dec 17, 12 noon, N-260/Conf. Rm. POC: Walt Miller, AJ6T at ext. 4-4558.

Native American Advisory Committee Meeting, Dec 22, 12 noon to 1 p.m., Ames Café. POC: Mike Liu at ext. 4-1132.

Ames Classifieds

Ads for the next issue should be sent to *astrogram@mail.arc.nasa.gov* by the Monday following publication of the present issue and must be resubmitted for each issue. Ads must involve personal needs or items; no commercial/third-party ads and will run on space-available basis only. First-time ads are given priority. Ads must include home phone numbers; however, Ames extensions will be accepted for carpool and lost and found ads only.

Housing

For sale: 1990 model, 1120 sq. ft., 2 bedroom, 2 bath, mobile home in Community of Older Persons, 55+, New Frontier mobile home park in Mt. View. Close to Ames. Vaulted ceilings in livingroom, dining room, ceiling fan in livingroom, skylight in kitchen, pantry, dishwasher, disposal, laundry room, large storage shed. $89,900. Call (650) 966-8426 eves or lv msg.

Female owner seeks adult(s), max. of three in house, to share large 4bd/2.5ba Milipitas home. Spacious master bdrm & priv. bath avail. for single ($725) OR couple ($1,000) plus part utils., OR two other rooms avail. from choice of three ($650, $550, $450) plus 1/3 utils. Cable, W/D, fireplace, pool & spa. 20 min from Ames. Easy access to H680/237/880. N/S. No alcohol/drugs/pets/kids. First/last and $400 dep. Avail. mid Jan 1999. Carina (408) 262-5269. lv msg.

Room for rent in Sunnyvale. Avail 1/1/99. Two bd/1ba apt. near El Camino off Mary. Barrie (408) 736-8961.

Room w/queen sized bed in 3bd/2ba home. Priv. bath. Prefer renter Mon-Fri who goes home for weekends. N. San Jose, off 680/Berryessa exit. $500/mo., $500 dep. & 1/3 utils to include PG&E, water & recycling. Mo. to mo. rental w/30 day notice if you leave. No pets. N/S. Access to amenities. W/D. Yard has pool, jacuzzi, patio w/barbecue. Dog in yd. Looking for clean, responsible & respectful individual. Avail. 12/4. Call (408) 926-4033.

Furnished room for rent w/phone. Walking distance from Castro. Share bath/kitchen/garden/laundry. Easy transport: bus/train + El Camino + H101, 237, 85 + Central Expressway. $560/mo. Available now. Call (650) 969-3932 or email at: solemate@best.com

Temp/part time space available from December. Furnished room with phone. Share: bath/kitchen/garden/laundry. Easy transport: bus/train + El Camino + H101. Weekly: $100 (+ one mo. dep.) Call (650) 969-3932 lv msg or email at: solemate@best.com

Available Dec. 1. $2,000/mo. rent, male or female, N/S pets negotiable. Share 3 bd/2.5 ba townhouse in Mountain View. Fireplace, yard, A/C, W/D. Easy access to Central Expressway, H101, 85. Lisa (650) 940-6941 or (650) 964-0786 or email at: laltera@semi.org.

Room for rent in Mountain View, available January. $480 per mo. plus dep/utils. Call (650) 967-9135.

Beautiful 1994 Golden West in family community, close to H101 & 237. Open floor plan, with vaulted ceilings throughout. Kitchen has plenty of cabinet space and a 2X4' skylight. Breakfast bar wraps around the counter. Ceiling fans in each bedroom. Master bedroom has huge walk in closet. Master bath has a garden tub, separate stall shower, linen closet, and 2'X4' sky light. $113,000. Call (408)734-4336.

Miscellaneous

Health Rider, excellent condition, includes extra weight package, $250. Herb/Ilene (408) 246-3616.

'96 Specialized Stumpjumper mtn bike: 17in frame; Rock Shox Mag 21 fork. Over $350 in brand new never used upgrades including XTR rear derailleur, XT shifters, XT bb, kevlar bead tires, clipless pedals! Barends & bottle cages. Must see! $600 firm w/custom wheelset (white ind. hubs, Mavic 217/517 rims, XT cogset) $1,000 firm. Call (408) 244-5124, lv msg.

Solid oak tables - both lt finish. 1 butcher block plus 4 chrs, 1 scalloped edge brand new, $350 each. Sofa & Loveseat, 15 yrs old but clean & comfy, $50 both. Barry (408) 354-1288.

Sharks tickets, Ctr Ice, 8 rows behind TV cameras $36 each (12/6,12/28,3/9,3/13,3/17). Craig (925) 930-7203.

Omega Speedmaster professional chronograph watch for sale. In very good condition. $900 or B/O. Doug (408) 927-5648.

Ceramic Cress kiln & molds; New Weslo cardio trainer; New Nordic Trac Twist & Ski; 2 new table top curio cabinets; 2, 4-drawer chest of drawers; Bacarlounger recliner chair; Prince Royal china service for 8. Call (510) 657-2017.

Maytag washer, excellent condition, $350. Sears Kenmore Dryer, good condition, $100. Call (650) 738-2967.

Lane cedar chest exc. cond, $225; beaded malachite necklace, $75; Tibetan singing bowl, $40; portable massage table $225. Susan (408) 255-4451.

Easy rider-1 year old, like new $150 or B/O. Sun Conur-small bird, very colorful, yellow, green and blue, Hand feed since birth, tamed, 4 years old. $300 or with cage $350. Great christmas gift. Call (510) 739-0769.

Furniture for sale: futon frame (no mattress), solid oak, 80" wide, $100; headboard, bookcase style, dbl bed size, lt. blond wood, 81" W x 39" H x 11" D, $30; dresser, 6 drawers, includes mirror, lt. blond wood, 51" W x 33" H x 14" D, $60. Jane (650) 949-1728.

Transportation

'82 Honda CB750 Super Sport motorcycle for sale. All orig. except new Kerker pipe. In very gd cond., always garaged, low mls. $1,700 or B/O. Doug (408) 927-5648.

'88 FXST/C H-D, 89" stroker, S&S bottom, Nitrided valves, S&S pistons (10.5:1) Andrews EV51 cam, highway geared, extended forward controls, dual headlamps, $14,000 or B/O. Call (805) 256-8835 or e-mail sky@as.net

'90 Plymouth Laser, grey silver. Call (408) 739-5851.

'90 Ford Escort GT, only 62K mls, exc. cond, 5 speed, cruise, tilt, $3,500 or B/O. Call (408) 723-8956..

'93 Toyota MR2, white, 5 sp, t-top, p/windows, locks, mirrors, A/C, cruise, stereo cassette, super low 44,990 mls. $10,800. Mac (408) 370-7576.

'94 Escort LX Wagon, automatic, excellent condition, alloy wheels, A/C, power windows, mirrors & locks, AM/FM/cassette, roof rack, cargo cover, 67k mls, $6,950 Call (408) 425-7705.

'97 Honda XR400, dual sport kit and CA license, many extras, excellent condition, $4,500. Call (650) 879-1380.

Vacation rental

Lake Tahoe-Squaw Valley townhse, 3bd/2ba, View of slopes, close to lifts. Wkend $400, midwk $150 nite. Includes linens, firewd, cleaning service. Call (650) 968-4155,or email at: DBMcKellar@aol.com

Carpool

Carpooling from Gilroy to Moffett. Work hours from 6:30 a.m. to 4:00 p.m. Every other week (I drive) will drop off kids (2) on Saratoga Ave. in morning. Takes about 20 minutes. Other week we trade driving. Cathie at ext. 4-1431.

Astrogram deadlines

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

Deadline	*Publication*
Mon, Nov 30	*Fri, Dec 11*
Mon, Jan 4, '99	*Fri, Jan 15*
Mon, Jan 18	*Fri, Jan 29*

Former employee passes away

Roger G. Morgan died August 29 at the Sierra Vista Rehab Center in Napa, CA. He had been ill since March 1996. He was resting comfortably at the time of his death and passed away quietly.

Roger G. Morgan

Morgan was an aerospace engineering technician at Ames and worked with the thermal and gas dynamics division in the thermal protection branch. Morgan is survived by his wife, Marcia Lucille Morgan. They were married for 62 years.

The Ames community was saddened to learn of the death of Elnar P. Ekholm 82, of Tucson, in May of this year. Survivors include his wife of 51 years, Irene; children, Beverly (Chris) Knovk, Elnar (Debby) Ekholm Jr.; grandchildren, Todd, Ashley, Cody, Nicholas, and nieces and nephews. Elnar was a proud veteran and NASA employee for 30 years. He will be greatly missed by all who knew and loved him.

Swimming Pool available

PST! Have you heard Ames has a swimming pool? The NASA Ames Exchange has acquired the pool just recently! The pool is 25 meters long and 20 meters wide. And, of course, it is comfortably heated, which makes it a great spot for recreational swimming as well as aquatic fitness. A smaller pool approximately 14 by 8 feet with a depth of three feet is ideal for younger children.

The pool deck is furnished with umbrella tables and plenty of chaise lounge chairs for those who wish to stretch out and relax. Bordering the deck is an enormous landscaped picnic area, featuring an outdoor dining deck, covered by a charming wooden gazebo. The pool and picnic area is fully lighted, so you can indulge in outdoor activities, day or night. Six iron barbecues stand ready to grill your favorites. A volleyball net hangs in the middle of a huge lawn, and a tetherball pole is available for you to give a whirl. Locker rooms are provided for both men and women, housing the changing areas, lockers, showers and saunas for the ultimate in relaxation. After all, it's time to relax!

The pool facility offers several different programs. The entire facility is available for party rentals, and can accommodate a variety of events. Lifeguards are included to make your event worry free!

Come on in; the water is great! The NASA pool offers daily lap swimming from 11:00 a.m. to 1:30 p.m., Monday through Friday. The experienced staff of lifeguards and instructors are Red Cross certified, offering swimming lessons to all ages and skill levels.

You are invited to stop by any weekday to visit. The swimming pool is located at Bldg. 109. The pool staff will be happy to answer any questions regarding event planning, lessons and even new program possibilities. Monthly passes are available for $25, daily lap swim $2, facility rental (4 hours) $200. Lesson charges vary. Family passes are available in the summer months. Please contact Jodi Neal at (650) 603-8025 for more information.

Put on your dancing shoes

A holiday dance party will be sponsored by the Ames Ballroom Dance Club on Saturday, December 5, from 7:00 p.m. to 11:30 p.m. at the Moffett Training and Conference Center, Bldg. 3. Dancers of all abilities, ABDC members or not, are welcome for an evening of ballroom dancing, dance lessons, dance demonstrations, refreshments, and a raffle/toy/food drive for charity. ABDC members: free; Non-members: $5/person. Make reservations with payment by Dec 2. POC: Kathy Sablan at ext. 4-6345 or ksablan@mail.arc.nasa.gov. Website: http://infosysd1.arc.nasa.gov/Info/BallroomDance/Welcome.html

THE AMES Astrogram

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

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