THE AMES Astrogram
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AMES RESEARCH CENTER, MOFFETT FIELD
May 29, 2001
on-line at: http://amesnews.arc.nasa.gov

Ames team evaluates South Pole research base

The South Pole is a long way from just about anywhere, but that isn't stopping an Ames team from trying to determine if it's a good place to conduct a search for Jupiter-sized planets orbiting around other stars. Using a small photometer specially modified to operate in the harsh Antarctic environment, the team, Douglas Caldwell, Robert Showen and Kevin Martin, deployed and tested a prototype this past February at the Amundsen-Scott South Pole Station.

Doug Caldwell (right) and Kevin Martin (left). The profile of the Vulcan South Camera, a small telescope that will look for exosolar planets, is in the front. It's so cold in this picture that the camera's shutter did not operate properly and caused the dark shading on the right.

The Vulcan South project is a sister project to Ames' Bill Borucki's Vulcan (North) planet search being conducted at the Lick Observatory east of San José. This project searches for the slight dimming of a star's light when a giant planet orbiting very near that star passes between it and the Earth. Because these "transits" are somewhat rare, thousands of stars must be observed simultaneously for long periods using a small telescope and a large-format CCD camera to yield results.

Vulcan South is taking the experience and technology gained from Vulcan (North) and is investigating the possibility of placing an autonomous version of the telescope at the South Pole for several winters. Placement at the pole is important because it takes advantage of some of the unique environmental characteristics found there. The most important of these characteristics is Antarctica's long winter night, which provides for uninterrupted observations of planetary transits. The second major advantage relates to the fact that stars don't rise and set at the South Pole; instead they seem to circle overhead. Since the Vulcan South telescope will follow one field of stars for the entire winter, the telescope will be looking through a constant thickness of atmosphere, or "air mass," all night long. This constant elevation angle provides a uniform level of atmospheric attenuation of the star light, thereby removing a prime source of "noise" found at all non-polar observatories. Both Vulcan projects and the Kepler project (a spaceborne telescope looking for Earth-sized planets) are part of an effort at Ames to discover and understand the frequency and distribution of planets around other stars.

photo by Doug Caldwell

The snowbound old dome at the South Pole.

The Vulcan South project is an excellent example of what can be achieved at Ames with a limited Directors Discretionary Fund budget and the enthusiastic support and cooperation of an eclectic group of participants and volunteers. With science, design, construction and management from codes SST, ASF and IC; machining and rapid prototyping from Codes FM, FMX and SSA; extreme environmental testing and thermal design from Code FEE and thermal quilting and insulation from some nice folks in the general public, we were able to put together a viable instrument in less than nine months. Additionally, equipment and logistical support for Vulcan South's deployment to Antarctica was graciously donated by the Rochester Institute of Technology and the Center for Astrophysics Research in Antarctica.

The results of the Vulcan South expedition to the South Pole indicate that the site would be an excellent place to set up a planet-search telescope. Despite the cold, the site offers good observing conditions and sufficient logistical support to run a small automated telescope. With proper funding, an over-winter deployment in 2003 of an autonomous telescope is very feasible.

More information about Vulcan, Vulcan South and Kepler can be found at the following web sites:

Vulcan: web99.arc.nasa.gov/~vulcan
Vulcan South: web99.arc.nasa.gov/~vulcan/south
Kepler: www.kepler.arc.nasa.gov

BY KEVIN MARTIN

Center Briefs

NASA image reveals giant chip off the Antarctic ice block

There appears to be a new crack in the Antarctic's icy armor. The massive iceberg-to-be was recently captured by a NASA satellite that's also tracing hidden continental features that shape the future of the world's largest ice sheets.

Landsat 7, a cooperative mission between NASA and the United States Geological Survey, Reston, VA, completed its second annual continent-wide mapping of Antarctica in February. With its capability to see features as small as 15 meters (50 feet) across, Landsat 7 provides the most detailed observations available of the remote continent, many parts of which have never been mapped at this resolution before.

Supervnova sheds light on dark universe

NASA's Hubble Space Telescope has recently seen a burst of light from an exploding star located much farther from Earth than any previously seen--a supernova blast in the early universe that is casting light on a mystery of truly cosmic scale.

This stellar explosion is extraordinary not only because of its tremendous distance, 10 billion light-years from Earth, but also because its discovery greatly bolsters the case for the existence of a mysterious form of "dark energy" pervading the universe. The concept of dark energy, which shoves galaxies away from each other at an ever-increasing speed, was first proposed, then discarded, by Albert Einstein early in the last century.

NASA education program starts

In May, NASA welcomed the first cadre of students participating in the new Undergraduate Student Research Program (USRP), another element in NASA's continued commitment to education excellence and support for academic research.

USRP attracted over 1,100 applications from undergraduate students around the country. Some 100 students representing 70 of the nation's colleges and universities will participate in this year's pilot program.

Dust can cause droughts

Windblown desert dust can choke rain clouds, cutting rainfall hundreds of miles away. This discovery, made with the help of NASA satellites, suggests that droughts over arid regions, such as central Africa, are made worse by damaging land and livestock management that expand the desert.

The findings, reported in the Proceedings of the National Academy of Sciences, present a new view of the decades-long drought in the African Sahel, which has been accompanied by increasing levels of airborne dust during the rainy season.

Ames Exchange helps reduce Center energy demand

The Ames Exchange has found a great way to help the Center reduce its energy thirst by 43,800 killowatt hours/year (kWh/yr). They have removed the lighting from all of the soda vending machines at Ames.

A typical soda machine has two florescent tubes illuminating the front. These lights were on 24 hours a day, for all 50 machines on Center. Based on data from PG&E, these 50 machines use enough energy just for lighting as is required to service seven typical California houses for a full year. Since April, the Exchange has had these lights turned off.

If you have any questions, contact Steve Frankel of Plant Engineering at ext 4-4214 or George Sutton of Electric Power Office at ext 4-0185.

If you would like to check the Ames Energy web page, visit it at: http://code.arc.nasa.gov/jf/energy/

New sign, new name, new image!

photo by Astrid Terlep

The NASA Ames Exchange Council is proud to announce that the Ames Café has changed its name. The new name, Mega Bites, better reflects the technology and research environment at Ames. There are also new signs for the Galileo Gift Shop, Tickets and Tours, etc.

Mega Bites provides a variety of freshly made food selections at breakfast and lunch, including hot entrées, cook to order grill, salad bar, sandwich and dessert stations, gourmet coffees and rotisserie items.

Now you can visit Mega Bites for lunch, shop for gifts or those always-needed sundries and pick up tickets for your weekend entertainment --all under one roof!

Center for Turbulence Research gets new deputy director

Dr. Nagi Nicolas Mansour of Code IN was recently appointed deputy director of the Center for Turbulence (CTR) based at Ames and Stanford University. The purpose of CTR is to stimulate advances in the physical understanding of chaotic flows in fluids such as air, water and even blood, according to Mansour.

The word turbulence derives from a Latin term meaning confusion, or crowd. Study of the "confused" motion of "crowds" of eddies is extremely complex and takes the combined efforts of highly-educated researchers and some of the most powerful supercomputers in the world, like those in the NASA Advanced Supercomputer (NAS) facility at Ames.

"The center is composed of about a dozen post-doctoral fellows and visiting scientists who collaborate with Stanford faculty and Ames civil servants to advance our physical understanding of turbulent flows," Mansour said. "Our tools are computer simulations that use supercomputers to emulate turbulent flows." At Ames the CTR offices are in Bldg. N202A next to the main library.

Founded in 1987, CTR is internationally famous for its work on flows where turbulence is the driving factor. "We study problems where the turbulent motion is controlling the characteristics of a fluid's flow," Mansour explained.

Richard Feynman called turbulence the most important unsolved problem of classical physics. Feynman was a co-winner of the Nobel Prize for physics in 1965, for his work on quantum electrodynamics.

The presence of turbulence leads to increased drag on an airplane and most of the noise of an aircraft. Quite possibly, it may even have helped life start near hydrothermal vents on ocean floors. "Turbulence is really the pacing item in our ability to understand the fluid flow within gas turbine engines, in combustion chambers and in airflow around aircraft," Mansour said.

"In a combustor, when you are mixing the fuel with the oxidizer, you try to use turbulence to enhance the mixing process," he said. "In such flows turbulence is the controlling mechanism in the operation of the device." A combustor is a combustion chamber where fuel burns in a gas turbine engine.

"We now are using models developed at CTR to simulate combustor fluid flow in a Pratt and Whitney gas turbine airplane engine burner," he said.

Although the main thrust of the Center's research is for aerospace applications, researchers also delve into the fields of meteorology, physics, geophysics, astrophysics, biology, biochemistry, astrobiology, oceanography, mathematics, computer science and other fields.

"Turbulence is ubiquitous in science and technology," Mansour continued. Chaotic motions are the hallmark of flows around aerospace vehicles, as well as the motions in nuclear fusion plasmas, planetary atmospheres and cosmic gas clouds around young stars that lead to the formation of planets.

"Scientists think that turbulence plays a dominant role in the formation of planets from collapsing dust clouds in space," Mansour said, commenting about on-going research programs. Using technology that scientists originally developed to study aerospace turbulent flows, researchers now are analyzing planet formation theories.

Image of a section through the Pratt and Whitney 6000 combustor (plane cutting through the injector symmetry plane) showing fluid flow.

"These studies involve understanding scales of motion that are astronomical in size," he said. "On the other extreme, CTR's research on turbulence control is motivating work on finding the best shapes for flowing fluids through microtubes as small as a human hair," he said.

Asked about Ames' basic contributions to the study of turbulence, Monsour said, "We are the pioneers in developing new computer codes and methods to enable the supercomputer to simulate extremely complex flows. In the early 70s, during the time of the Illinois Automatic Computer (ILLIAC), an experimental multi-processor supercomputer, scientists in the group had to write their own computer languages and interpreters known as compilers, in order to utilize the full capability of that machine. This approach has continued until today."

Many scientists at Ames, CTR and major universities who run large-scale simulations of turbulence still use "Vectoral," a computer language developed by Dr. Alan Wray, a senior scientist at Ames, Mansour said.

"We were the first people to do full simulations of turbulence without any modeling," he said. "When you conduct a simulation, you are actually reproducing the physics of the flow with all of its details. When modeling, you are using mathematical models that mimic the effects of the chaotic motions of the fluid without all the details of the flow," he explained.

Describing why the center's simulation work is important, he said, "A straight forward way to use the results from the simulations is to test the fidelity of the mathematical models that engineers use to predict aerodynamic flows around aerospace vehicles." Full simulations, he explained, require more computer resources, including time and computer power, than a computer code that calculates mathematical models of turbulence.

"Our scientists are anxiously awaiting the boot up of a 1024-processor parallel supercomputer at Ames to carry out even higher fidelity simulations," he said. "Having these supercomputers allows us to reproduce the details of the geometry of the combustor much more accurately."

"In simulating turbulent flows, the more computer power we get, the finer our resolution of the actual geometry; and, therefore, the fidelity of the simulation increases," he explained.

"As the demand for high performance and less pollution from exhausts of aircraft engines becomes greater, the need for higher-fidelity predictions of performance will become greater. Looking at it from the present day, there seems to be an insatiable need for ever-more-powerful supercomputers," he said.

Asked what are the most interesting turbulence studies to him, Mansour said, "The most rewarding studies are those in which turbulence plays the critical role in understanding physical behavior. These include simulations of planetary formation, turbulence in the sun's atmosphere as well as other studies of engineering interest."

BY JOHN BLUCK

VPP STAR Tip

"The people we talked to who were interviewed said OSHA representatives were relaxed, did not openly take notes and proceeded with related dialog. Interviewees felt better coming out of the interview, not because it was over, but because it was a positive experience and well received. Going in, they were nervous to some degree."
…VPP Lessons Learned 1999, Johnson Space Center

Earth Day 2001 at Ames!

The Ames Environmental Services office would like to thank everyone for their participation in Earth Day 2001, and hopes you enjoyed the programs.

Attendance was high at the events. Over 100 people went on a bird hike, including 30 kids from the Ames' Child Care Center. Over 100 people attended the lunchtime presentations. Others attended the street fair, where they were able to play the drums and/or salsa in the rain, appreciate the beauty of nature--both live and preserved--as well as speak with local individuals involved in environmental conservation efforts in the area.

Throughout the year, on a quarterly basis, Code QE hosts brown bag lunches at which a speaker educates employees on various environmental topics. The next brown bag lunch will be on this year's theme, "conservation." The date is still to be determined.

If you have any comments or questions about any of the events, contact Julie Quanz, environmental compliance specialist, at ext. 4-6810 or jquanz@mail.arc.nasa.gov. Check the web site at: http://q.arc.nasa.gov/qe/events/ED/ for more photos.

photo by Phil Ting

Earth Day at Ames shows enthusiastic crowds along Durand Road.

Earth Day is Every Day!

photo by Dominic Hart

Ames' Chris Alderete looking at burrowing owl habitat during the bird hike.

photo by Astrid Terlep

A live Peregrine falcon on display at the Ames Earth Day Fair.

photo by Astrid Terlep

Electric scooters and an electric bike were hits at the Street Fair.

photo by Dominc Hart

An egret is displayed at one of the wildlife exhibitor's tables.

photo by Jennifer Magpayo

Jim Greiner's "Hands On Drumming" drew a lot of attention.

Sixty-mile journey to save women's lives

When was the last time you saved someone's life? When did you last spend three days and two nights with nearly 3,000 strangers pursuing the same goal? Most people have never done anything like that, but this is exactly what three extraordinary Ames' women will do this summer.

From July 27 through 29, Ames' News Chief Ann Hutchison, Amberlee Chaussee of Ames' educational technology team, and environmental compliance specialist Dana Bolles will take part in the 60-mile Avon Breast Cancer three-day walk from Santa Clara to San Francisco. Organizers expect the event to raise more than $6 million for breast cancer research.

Breast cancer is the most common form of cancer in women in this country. " Breast cancer strikes women of every race and social group," said Hutchison. "We have made great strides in detection and treatment of the disease, but there is still a long way to go."

According to the National Cancer Institute, over 40,000 women are expected to die of breast cancer just this year. Every single woman is at risk, and unfortunately, there is no cure or way to prevent the disease. However, the lives of over 17,000 women could be saved annually if their breast cancer was detected earlier.

Many people are inspired to participate in this fundraising event by their mothers, sisters, daughters and friends who defeated breast cancer or died from the disease.

"By joining with the thousands of walkers and tens of thousands of sponsors, I have the opportunity to make a real difference in the lives of people I will never meet. This is a wonderful way for people to take part in something bigger than themselves, to help make a difference," said Hutchison, who has two friends fighting breast cancer.

"This event has an incredible impact on breast cancer survivors, their families and friends and all others who are touched by terminal illness. Life is hard enough with all the obstacles that come up," added Dana Bolles, who will participate in the event from her wheel chair. "But when we see how much others really do care, and how much they are willing to sacrifice, even if they don't know you personally, it makes all of the struggles worth while."

This year, there will be nine walks held around the country. Each walk will have 3,000 to 4,000 walkers trying to raise a minimum of $1,900 each. Nearly $60 million will be pledged by the friends and co-workers of the walk participants. Besides thousands of walkers like Hutchison and Bolles, there will be hundreds of people providing medical services and camping support.

Amberlee Chaussee will be a member of the crew that will be responsible for the giant "mobile city" that will become a home for the walkers for three days. "Crew members will prepare meals and snacks, set up the tents, provide support and participate in all the miscellaneous tasks that are required to make such a large event successful," said Chaussee. "There also will be medical personnel and transportation for those who won't be able to finish the walk."

Hutchison and Bolles have two more months to reach their goal of raising $1,900 each and getting physically prepared for the 60-mile walk. Let's wish them luck and cheer for the thousands of others as they walk to find a cure for a horrible disease that affects one of every eight women in the United States.

To learn more about the 3-Day Walk, visit the Avon Breast Cancer official web site at: http://www.breastcancer3day.org/

photo by Victoria Kushnir

For three days, July 27-29, Ames' News Chief Ann Hutchison (left), Amberlee Chaussee of Ames' educational technology team (right), and environmental compliance specialist Dana Bolles (center) will take part in the 60-mile Avon Breast Cancer 3-Day Walk from Santa Clara to San Francisco.

To make donations to one of the volunteers, simply log on to the event web site at: http://www.breastcancer3day.org/ and follow the instructions.

You can contact Ann Hutchison at email: ahutchison@mail.arc.nasa.gov, Amberlee Chaussee at email: achaussee@mail.arc.nasa.gov or Dana Bolles at email: dbolles@mail.arc.nasa.gov.

BY VICTORIA KUSHNIR

Romanian Space Agency visitor

photo by Tom Trower

Dr. Marius Piso, Executive Director of the Romanian Space Agency (left), shakes hands with Dr. Harry McDonald (center) as Deputy Director Bill Berry looks on.

Annual charity golf tournament and BBQ set

The annual charity Tennessee Ernie Ford AFA Chapter 361 Golf Tournament and BBQ is scheduled for July 13 at the Moffett golf course. Sign in time is 11:30 a.m. and shotgun start is 12:30 p.m. The Reserve Officer Training Corps (ROTC) and Junior Reserve Officer Training Corps (JROTC) programs provide training, education and field experience for university and high school students in preparation for military careers. The Air Force Association (AFA) awards program recognizes and rewards outstanding performance by military and civilian personnel and ROTC/JROTC students and creates a wider awareness of the Air Force as a career choice.

The scramble format tournament will feature several special events: low gross for first, second and third places, longest drive, straightest drive and closest to pin. Only 144 golfers can participate and the deadline for entry is July 6.

To receive an entry form for the tournament, contact Jim Martin at: jmartin871@aol.com or call (408) 395-2039.

Sze helps celebrate diversity at Ames

photo by Tom Trower

Kristen Sze, co-anchor for the ABC Channel 7 Morning News, chats with Bill Berry, Deputy Center Director. Sze was guest speaker at the Ames Asian and Pacific Islander Heritage Luncheon held on May 21 in the Moffett Training and Conference Center ballroom.

Technology seminar schedule

Chuck Thacker and Butler Lampson of Microsoft Corporation will speak on "The Xerox Alto: A Personal Retrospective" on June 4, in the Ames main auditorium. A reception will follow in the Computer Museum's visible storage exhibit area in Building 126.

Thirty years ago, the Xerox Palo Alto Research Center created a paradigm shift in computing. Many of the technologies that make today's personal computers attractive, including high-quality graphical user interfaces, window systems, networked distributed computing, and laser printing, were mature technologies at PARC by the end of the '70s. The platform on which many of these technologies were developed was the Alto personal computer. Although small and slow by today's standards, the Alto's flexibility made it an ideal system for hardware and software experimentation. In this talk, Thacker and Lampson will describe a few of the applications and technologies the Alto enabled, as well as the exceptional working environment at PARC and the extraordinarily talented group of people who made it all happen.

Advance reservations are required to attend. Please respond by May 31, 2001 to Wendy Ann Francis at ext. 4-5205 or email at: francis@computerhistory.org. For more information on the event, see: URL: http://www.computerhistory.org/events/lectures/alto_06042001

Chen passes away

Dr. James R. Chen, a research computer scientist in Code IC for the past eight years, died May 1 in an automobile accident on his way home from work. He is survived by his wife, Lily Chang, his sisters Yiko, Ida, Eva, Gina and Nina, and his mother and father, Grace and Y.K. Chen was 45.

Chen was born on Sept. 11, 1955, in Taipei, Taiwan. He received a B.S. in physics from the National Tsing Hua University in 1977, a M.S. in industrial engineering from the University of Wisconsin in 1981, and a Ph.D in computer science from the University of California, San Diego in 1993. He had received awards for both his teaching and research in computer science.

Chen worked at Signetics, FMC Ordnance, Apple Computer and IBM before joining NASA in 1993. At Ames, he conducted research on machine learning, digital libraries, and information management, most recently as part of the Science Desk Project. He was also the principal investigator for the DIAMS system, an agent-based collaborative information management system.

Outside of work, Chen was an active member of the Bay Area Yan Xin Qigong Society.

Chen will be remembered at Ames as a quiet, kind, gentle man who made a lasting impression on those he worked with. He was a colleague and mentor, but above all, a friend. He will be missed greatly.

Dr. James R. Chen

Merrill H. Mead passes away

Merrill H. "Bill" Mead, an aeronautical engineer and manager at Ames for 33 years, died of lung disease at his home in Milpitas on May 7. He was 75.

Born in Los Angeles, CA, Mead graduated from Palo Alto High School in 1943. As a member of the Navy's V-12 program, he earned a B.S. in aeronautical engineering from the University of Minnesota and began work at the NACA-Ames Aeronautical Laboratory in late 1947.

Mead's initial position at Ames was in the 6X6 supersonic wind tunnel, where he conducted theoretical and experimental research on problems of aerodynamic stability and control of supersonic missiles and aircraft. He subsequently obtained an M.S. in aeronautical engineering from Stanford University in 1954.

In 1955, Mead moved into the first of a series of management positions, becoming a technical assistant reporting to Russ Robinson, Assistant Director for Aeronautics. After an assignment managing the group developing the guidance and nagivation laws for the Apollo spacecraft entry into the Earth's atmosphere, Mead was selected as Ames' first recipient of the prestigious MIT Sloan Fellowship. He attained an M.S. in industrial management from the Massachusetts Institute of Technology in 1963.

Upon returning to Ames, Mead found his true calling in resources management and eventually became responsible for the planning, preparation and defense of Ames' annual R&D, construction of facilities, and institutional budgets. From 1963 to 1971, he served as chief of the Technical Planning Division (later called the Programs and Resources office) and also completed a 16-month assignment at NASA Headquarters as director of the Programs and Resources Division of the Office of Advanced Research and Technology. Mead was Deputy Director of Administration (which included financial management, personnel, procurement, services and supply, technical information, resources management, and technology utilization) from 1971 until he retired from Ames in 1981. He will perhaps be best remembered for the rigor and integrity he brought to resources management and the respect he earned for its community of practitioners.

Mead was preceded in death by his daughter Laura and his son Richard. He is survived by his wife of 26 years, Susan Collins Mead, who was also an Ames employee for 30 years; daughters Ann Mead of San Francisco and Melinda Padgett of Santa Cruz; granddaughter Lorraine Padgett; sister Martha Borland of Washougal, WA; and his first wife, Carol Wood Mead of Los Altos.

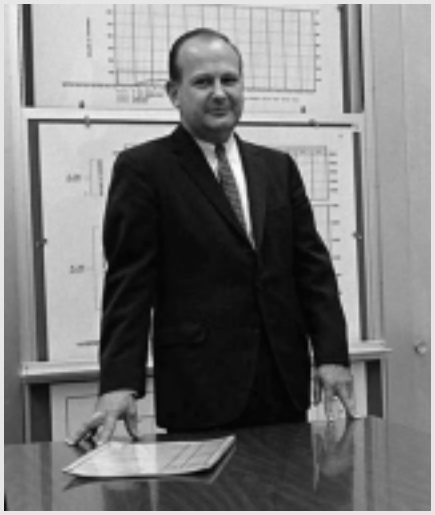

photo by Emerson Shaw

Merrill H. Mead

A memorial service will be held at Stanford Memorial Church at 3:30 p.m. on Thursday, June 7. In lieu of flowers, remembrances may be made to The Lamplighters (San Francisco's world-renowned Gilbert and Sullivan Company) at P. O. Box 77367, San Francisco, CA 94107 in memory of Merrill H. Mead or to a charitable organization of your choice.

Becoming light-hearted: managing stress and change through humor

The world we live in, once seen as regular and reasonable, is now uncertain and unpredictable. As "thriving on chaos" becomes the norm in the Bay Area, we must find new ways of being confident and comfortable in these situations. Humor is an excellent tool for attaining equilibrium because humor offers individuals, families and organizations a proven way to feel in balance and more in control. Humor is a positive factor in helping to manage stress, maintain physical and emotional health, spark creativity, sustain optimism, and foster positive relationships.

Please join Izzy Gesell in a presentation entitled, "Becoming Light-Hearted: Managing Stress and Change Through Humor" on June 7 from 10 a.m. to 11:30 a.m. in the main auditorium.

Gesell has been working with humor and communication all his adult life as a teacher, stand-up comedian, author, corporate trainer, professional speaker and workshop leader. He is also a "humor and creativity coach," helping people bring humor and fun into their work, their presentations and their personalities.

Gesell believes humor, imagination and playfulness are powerful resources for humans because they help us become more effective, both personally and professionally. He is nationally known as an expert in helping organizations and their people thrive and prosper during changing times. His clients include NASA, Hewlett-Packard, Chrysler, the Internal Revenue Service, HBO and office staff of the US House of Representatives. This program shows how humor works, why it is such a valuable resource, how it increases individual and organization effectiveness and how to bring it into your life on a daily basis.

Gesell is originally from Brooklyn, NY, where a sense of humor is a survival skill, he says. He has a BA in psychology, an MS in education and a P (that's a third of a PhD). He recently was honored as a Certified Speaking Professional (CSP) by the National Speakers Association. Less than 10 percent of NSA's 4,000 members are CSPs.

For more information on this presentation, contact Miriam Glazer at ext. 4-5172.

Izzy Gesell, professional speaker and corporate motivator, will be presenting at Ames on June 7.

Ames sends hardware to International Space Station

The second set of space hardware from Ames completed its journey to the International Space Station (ISS) on the space shuttle Endeavour recently. Launch occurred on April 19 from Florida's Kennedy Space Center.

This hardware is the last part of a suite of radiation-measuring dosimeters known as the passive dosimeter system (PDS), which will serve as a flexible and easy-to-use radiation monitor inside the ISS. The PDS, which will be available for use by any researcher, also will serve as a useful complement to existing dosimeters used for routine ISS operations. Endeavour carried the remaining PDS hardware, which includes 12 plastic nuclear track detector assemblies (PNTDs).

"The PNTDs provide a unique capability to measure the dose of high-energy particles, which can interact with living organisms," said Robert Jackson, PDS payload manager in Ames' Space Projects Division. "Monitoring radiation exposure is important both to crew health and to future scientific research on the ISS."

Each PNTD assembly consists of PNTD stacks and holders. The stacks are thin sheets of CR 39 polycarbonate plastic with clear Lexan covers for protection. The CR 39 plastic is similar to material used for some eyeglass lenses. The stacks are inserted into a Nomex cloth-and-aluminum holder that attaches to the other type of dosimeters, known as thermoluminescent detectors, or TLDs. The PNTDs will be co-located with the TLDs during dose accumulation. The holder keeps the PNTD stacks aligned with each other.

As heavy charged ions pass through the PNTDs, the surface becomes pitted with tiny craters. After the detectors are returned to Earth, the plastic is etched to enlarge the craters. After counting the craters, technicians will analyze their shapes and sizes with a microscope. This information is used to improve the accuracy of the radiation dose recorded by the other type of dosimeters and to improve the estimate of the radiation's biological effects. The PNTDs are important in determining the energy spectrum of the radiation absorbed by the TLDs. ERIL Research Company, San Rafael, CA provided the PNTDs and will analyze them after they are returned to Earth on the STS-105 mission later this year.

Understanding the radiation environment on the ISS should help scientists explain experimental results that otherwise might be unaccounted for. The radiation measurements can help scientists determine whether a given effect is due to microgravity, radiation or another factor. The PDS will be part of NASA's laboratory support equipment and will be available to life science investigators from the space station's international partners.

Space shuttle Discovery carried the first part of the PDS – the TLDs and electronic reader– to the International Space Station in early March. TLDs contain calcium sulfate crystals that absorb energy from incident ionizing radiation. This process steadily increases the energy level of the electrons in the crystal. After an astronaut aboard the ISS places the dosimeter into the electronic reader, a component inside the reader heats the crystals.

As they are heated, the crystals emit a glow of light proportional to the amount of radiation to which they were exposed. A photomultiplier tube in the reader measures this glow. The reader then stores the measured dose on a memory card that can be returned to Earth for further analysis. After the crystals have emitted all the stored energy, they are ready to begin accumulating another dose and the TLD is ready to be reused. The TLDs will remain onboard the ISS indefinitely to support a variety of future life sciences experiments.

The entire passive dosimeter system will be used to measure radiation as part of the DOSMAP experiment, which is being conducted by the NASA Human Research Facility on the ISS.

Ames has led NASA efforts to verify and certify the dosimeters for safety, and to package them in one of four transport containers, which resemble soft insulated lunch bags. Three kits, each holding TLDs, a reader and associated power and data cables, were carried to the ISS on STS-102. The recent mission took the final kit, which includes 12 PNTDs and 2 memory cards for the TLD reader.

"The successful use of this suite of radiation monitoring dosimeters will mark the conclusion of its development and its transition to routine use of the system to provide radiation measurements for a variety of experiments in the ISS," Jackson said.

BY ANN HUTCHISON

SAFETY SNAPSHOTS

This feature is one in a series intended to inform the Ames community about facets of Ames' safety and health programs.

Fall Protection

PROFILE

From guardrails to body harnesses and lanyards, from proper ladder selection to safe scaffolding construction, fall protection saves lives and prevents serious injury. Job Hazard Analysis (JHA) is one means of identifying those tasks where falls may occur--from elevated surfaces, during equipment repair and maintenance, or into openings in walls or floors.

CLOSEUP

Michael Hulet, occupational safety manager, is developing a conservative approach to fall protection that reflects the need to be prepared for non-routine operations at Ames. New policies will be added to Ames' safety manual. General industry safety regulation requirements for fall protection (non-construction work) apply to operations at elevations above 4 feet. This means that barriers, body harnesses and lanyards, or other protection devices are required for employees performing these operations.

Recent events at Ames have heightened awareness of the danger of working at extended heights. Unsafe practices, if continued, can eventually lead to serious injuries and even fatalities. All employees involved with maintenance and equipment operation with a fall hazard need to review each step of even routine operations, and complete a written job hazard analysis for non-routine tasks. Careful job hazard analysis will ensure that fall hazards are recognized and protective measures provided.

Ames' safety training program provides a course in fall protection, course number NSTC 311. The topic fall protection is also covered in Ames' manlift equipment class.

For more information about fall protection, contact Michael Hulet at ext. 4-0268. For course information and training requirements, contact John Goldbach at ext. 4-2592.

Event Calendar

Model HO/HOn3 Railroad Train Club at Moffett Field invites train buffs to visit & join the club in Bldg. 126, across from the south end of Hangar One. Work nights are usually on Friday nights from 7:30 p.m. to 9:30 p.m. Play time is Sunday from 2 p.m. to 4 p.m. For more info, call John Donovan (408) 735-4954 (W) or (408) 281-2899 (H).

Jetstream Toastmasters, Mondays, 12 noon to 1 p.m., N-269/Rm. 179. Guests welcome. POC: Samson Cheung at ext. 4-2875 or Lich Tran at ext. 4-5997.

Ames Ballroom Dance Club, Tuesdays: East Coast Swing and Jive 6/5, 6/12, 6/19, Paso Doble 6/26. 3 levels of classes, from Beg. to Int., 5:15 - 6:45pm. Classes in Building 944, the Recreation Center. Women dancers encouraged to join. POC: Helen Hwang, hwang@dm1.arc.nasa.gov.

Ames Bowling League, winter league from September through April on Tuesdays, at 6 p.m. at Palo Alto Bowl. Bowlers needed. POC: Mike Liu at ext. 4-1132.

Ames Diabetics (AAD), meet twice a month on first & third Wednesdays, 12 noon to 1 p.m., in the Ames Café, far corner of Sun room. Peer support group that discusses news that affects diabetics, both type I & II & exchange experiences in treatment & control & help each other best cope with the disease. POC: Bob Mohlenhoff, ext. 4-2523, or email at: bmohlenhoff@mail.arc.nasa.gov.

Ames Child Care Center Board of Directors Mtg, Every other Thursday (check website for meeting dates: http://accc.arc.nasa.gov), 12 noon to 2:00 p.m., N269, rm. 201. POC: Katharine Lee, ext 4-5051.

Nat'l Association of Retired Federal Employees, (NARFE), San Jose Chapter #50, Mtg, Jun 1, at Hometown Buffett, Westgate Mall, 4735 Hamilton Av, San Jose. Prog. & bus. mtg. at 9 a.m., followed by lunch, $6.27, in a reserved area. Program starts at 9:30 a.m. followed by lunch. POC: Rod Perry (650) 967-9418 or NARFE 1-800-627-3394.

Ames Contractor Council Mtg, Jun 6, 11 a.m., N-200, Comm. Rm. POC: David Lawrence at ext. 4-6434.

Environmental, Health and Safety Monthly Information Forum, Jun 7, 8:30 a.m. to 9:30 a.m., Bldg. 19/Rm 1040. POC: Julie Quanz at ext. 4-6810.

NFFE Local 997 Union General Mtg, Jun 20, noon to 1 p.m., Bldg. 19/Rm. 2017. Guests welcome. POC: Marianne Mosher at ext. 4-4055.

Ames Amateur Radio Club, Jun 21, 12 noon, T28-N (across from N-255). POC: Michael Wright, KG6BFK, at ext. 4-6262. URL: http://hamradio.arc.nasa.gov

Native American Advisory Committee mtg, June 26, 12 noon to 1 p.m., Building 19, room 1096. 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; Ames extensions and email addresses will be accepted for carpool and lost & found ads only. Due to the volume of material received, we are unable to verify the accuracy of the statements made in the ads.

Housing

3 bd/1.5 ba, 2-story twnhs on Luz Avenue, San José. Freshly painted inside, dishwasher, gas heat, w/w carpet, outside child play area/large patio. 1 car port. Easy access to H101/680/280. $295K. Azucena (408) 559-2881.

NRC senior research associate & spouse seek a furnished 2 bdrm apartment or house, Feb 1 to end July 2001. Interested in buying/leasing a cheap, used car for this period. Sophie Wuerger, email to: s.m.wuerger@keele.ac.uk or phone (+44 1782 752299 or +44 1782 584214) or by fax (+44 1782 583055).

3 bd/ 2 ba, 1560 sq.ft. 1-story house in South San Jose. Two-car gar., 6000 sq.ft. lot. New paint in & out, new lawn, auto sprinklers. 4 years new roof, double-pane windows & large patio. Easy access to Hwys 101, 85 & 87; schools &shopping. $485k. Girish (408) 363-8727.

Room in 4 bd/2 ba home, excellent Mtn View area. Washer, drier, fireplace, microwave, new carpet, cable modem, PG&E block 50. Tidy person & N/S. $425 + share utils. Avail. 6/1. Call (650) 964-1900.

Expanded & remodeled, 4bd/2ba home available for rent for one year starting July '01. West San Jose. Moreland school district. 30 min commute. Quiet street w/great neighbors. Avail. fully or partially furnished. No smoking, no pets. $2,500/mo. Carol (408) 253-7417.

3 bd/2 ba, duplex, W. Cupertino: Includes family room, laundry rm, fireplace, 2 car garage, upgraded kitchen w/microwave, landscaped backyard & patio; owner's unit. $2,850/mo. Call (408) 257-5308.

One room needed beginning early June. Close proximity to Ames or easy access to cal train. Irish, professioal female, N/S, for long term if possible, 1-2 years, rent approx: $500/mo or negotiable. Diane e-mail diane_purcell@hotmail.com at call (650) 903-0332.

Miscellaneous

Beautiful glass table, beveled edges, 42"x72" for dining or office. $100 or B/O. Call (408) 296-8182.

Go-Kart – one year old, 6 Hp, 2 seats with seatbelts. Waleska (650) 625-8980 after 5 p.m.

Mountain View/Los Altos Senior Babe Ruth baseball signups, ages 16 to 18. Call (650) 966-8027.

Baby swing $15; baby bounce seat $10; car seat $20; bathtub $5; blanket toy $7. Deanna (408) 260-1180 between 5 and 9 p.m.

Culligan, Reverse Osmosis, sink water system. 3 weeks old, $1,000. Call (408) 365-7575.

Beige leather sofa-recliner and matching loveseat in exc. con., $1,400. See http://members.fortunecity.com/pengluchian/sofa/. Call (650) 938-6546.

25 ft. 1985 Alpenlite 5th wheel trailer. clean, loaded, new batteries and propane tanks. $6,900. Call (650) 369-0578.

1 Morrow (cpm} computer, complete with monitor, keyboard and epsom printter. Any offers. Call (408) 739-5233.

Gulbranson upright piano for sale. good shape, all keys work, sounds great. A bargain at $199 plus moving expenses. Call (650) 969-0787.

NRC post-doctoral fellow from Chile needs household items of all sorts. Call Marcela ext. 4-3279 or Sigrid (408) 296-6235.

Looking for more participants to be part of a group in purchasing San José Sharks tickets for next season. Need commitment up front to be able to get four seats together for the whole season. Call (408) 735-0524.

49er Tix (pair). Section 53 UR. Pre-season: 8/25 Seattle $80/pair. Regular Season (each at $110/pair): 9/9 Atlanta, 10/7 Carolina, 12/22 Philadelphia. Call (510) 656-7654.

Speedaire compressor 1.5 Hp for $100; Macintosh Powerbook 180 for $100; 5 disk CD player for $50. Call (408) 270-1471.

Transportation

'70 VW convertible classic, original owner, no smog needed; transmission ok; needs work on top & possibly engine. $1,600. Esther or Art (650) 961-2732.

'87 Chevy Nova, dark blue, four-door sedan, 160K mls, used mainly for transportation from Oakland to Mtn. View. Carfax vehicle history report available upon request. Auto. trans, ·A/C, $1,300 or B/O. Shavon (510) 532-7910--ask for John Turner or e-mail: walkie74@yahoo.com

'88 Audi 90 Quattro, 97K mls, 5-spd, 2.3L, red w/ blk leather, heated seats, ski package, power doors/ windows/sunroof, a very nice car. $5K. Call (408) 734-3730.

'95 Mercury Tracer Wagon, Trio, exc. condition, Loaded, 68K mls, one owner, $5,700 or B/O. Herb (408) 246-3616.

'99 Honda Accord, 4dr, forest green, 42K mls, Orig. owner, auto trans, air con, power steering/windows/ locks, cruise cntrol, am/fm cassette, full mask, heavy duty floor mats, cargo net, door guards, seat covers, new tires and brakes. Exc con. 15,600 or B/O. Serious only please, John (510) 785-6519 or (510) 539-6107 pgr

'99 Jeep Grand Cherokee Laredo 4X4; 6cyl., dual power seats, leather, 10 disc CD chgr., tow package, 42K mls, asking $21,000. Call (408) 823-1111.

Ames public radio

1700 KHz AM radio -- information announcements & emergency instructions, when appropriate, for Ames employees.

Lost & Found

Moffett Field Lost and Found may be reached at ext. 4-5416 at any time. Residents and employees at Ames may also use Internet browser at: http://ccf.arc.nasa.gov/codejp/pages/lostFound.html to view a list of found property and obtain specific instructions for reporting lost or found property and how to recover found property. Call Moffett Field security police investigations section at ext. 4-1359 or email at: mfine@mail.arc.nasa.gov.

Exchange Information

Information about products, services and opportunities provided to the employee and contractor community by the Ames Exchange Council.

Beyond Galileo N-235 (8 a.m. to 2 p.m.)

New items arriving daily. Stop by and see the unique one of kind items. Ask about the NASA customized gifts for special occasions.

Mega Bites (Ames Café) N-235 (6 a.m. to 2 p.m.)

Catering is available for your office BBQ. BBQ choices: hamburger, veggie burger, hot dog, potato or pasta salad, 1/2 assorted soads, 1/2 bottle water; cookies. Price per person if you do the cooking, $7.50. Price per person with Mega Bites cooking, $8.00. Chicken $9.95 - $12.95; steak or ribs $12.95 and up. Side orders: beans, garlic bread or add'l salads, $1 per person.

Visitor Center Gift Shop N-223 (10 a.m. to 4:30 p.m.)

NASA logo merchandise, souvenirs, toys, gifts and educational items. Make your reservations for Chase Park here.

Tickets, etc... (N-235, 8 a.m. to 2 p.m.)

Entertainment and transit tickets. Great discounts on many favorites. Stop by and check out the entertainment tickets for summer fun!

NASA Lodge (N-19) 603-7100

Open 7 days a week, 7:00 a.m. to 10 p.m.
Rates from $40 - $50.

NASA Swim Center (N108) 603-8025

June 11 summer hours begin. Summer swim programs start June 18. Sign up early . Lessons for all ages.

Vacation Opportunities

Lake Tahoe-Squaw Valley townhse, 3bd/2ba, view of slopes, close to lifts. Wkend $490, midwk $180 nite. Includes linens, firewood. Call (650) 968-4155 or e-mail DBMcKellar@aol.com

South Lake Tahoe cottage with wood fireplace and hot tub. Rates from $50 to $130 per night. Call (650) 967-7659 or (650) 704-7732.

Hybrid combustion research project

Ames and Stanford University are researching a new type of fast-burning hybrid rocket fuel.

Commonly, hybrid rockets use a hydrocarbon-based solid fuel and a liquid oxidizer. The oxidizer is injected into a combustion chamber that contains fuel. There, it is ignited and burned. Hybrid fuels, used in the past, burned too slowly to generate performance comparable to liquid or solid rocket motors. At Stanford University, bench-top experiments were recently conducted on a paraffin formulation that proved to burn approximately three times faster than the most advanced hybrid fuel. If these bench-top results scale as hoped, it may be possible to develop paraffin fueled rocket boosters for the shuttle and other uses.

The Ames hybrid combustion project goals are twofold. The primary goal is to determine whether the paraffin fuel will work in a motor that is significantly larger than that of the Stanford experiments. Secondarily, project members would like to advance understanding of the fluid mechanic processes responsible for the performance of this new generation rocket fuel.

The benefits of this technology are that it is cleaner and safer to handle than most other fuels. The byproducts of combustion are carbon dioxide and water. In contrast, the combustion byproducts of solid propellant rockets often include acidic gases, aluminum chloride, carbon monoxide, hydrogen chloride and aluminum oxide.

Testing will take place at the Outdoor Aerodynamics Research Facility (OARF). Testing will begin June 2001 and will last approximately two years. Roughly 200 test runs will be conducted. A maximum of one test will be conducted per day. Tests will have very short run times. Most tests will be completed in 10 seconds or less, while a few tests will last up to 20 seconds.

An extensive environmental review of the project has taken place. This research project was subject to the National Environmental Policy Act's environmental review requirements. A record of environmental consideration was prepared and is on file at Ames. Potential environmental impacts include noise to the surrounding communities and to the wildlife habitat in the immediate area. The environmental review determined that this project qualifies for a categorical exclusion.

The results of noise models indicate that, during testing, the noise level will be less than 100 dB (comparable to an aircraft taking off) in the majority of inhabited areas within Ames. The facility points towards the bay, thus reducing the noise impacts to Ames and the surrounding community. The tests will typically be conducted during the afternoon from 1:00 p.m. to 4:00 p.m. Noise surveys will be conducted at various locations during testing to substantiate the predicted noise levels. A noise barrier will be installed, if deemed necessary.

The US Fish and Wildlife Service determined that the proposed project would not adversely affect the California Clapper Rail.

This research project provides Ames with an excellent opportunity to research an environmentally beneficial technology. Additional information may be obtained by contacting Sheila Johnson of Ames' Office of Communication at ext. 4-5054.

BY JULIE A. QUANZ

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, Jun 4	*Mon, Jun 11*
Mon, Jun 18	*Mon, Jun 25*
Mon, Jul 2	*Mon, Jul 9*
Mon, Jul 16	*Mon, Jul 23*
Mon, Jul 30	*Mon, Aug 6*
Mon, Aug 13	*Mon, Aug 20*
Mon, Aug 27	*Mon, Sep 3*
Mon, Sep 10	*Mon, Sep 17*
Mon, Sep 24	*Mon, Oct 1*
Mon, Oct 8	*Mon, Oct 15*

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