

June 2008

NASA, Google announce lease at Ames Research Center

BY MICHAEL MEWHINNEY

NASA and Google Inc. announced on June 4 plans to develop a new high-technology campus at NASA Ames.



Photo courtesy Google

NASA and Google recently signed a 40-year lease agreement for Google to use 42.2 acres of land at Ames' NASA Research Park. Above is an overview of the area, top left corner, where Google will construct up to 1.2 million square feet of offices and R&D facilities.

Under the terms of the 40-year agreement, Google will lease 42.2 acres of unimproved land in NASA Research Park at Ames to construct up to 1.2 million square feet of offices and research and development (R&D) facilities in a campus-style setting.

"With this new campus, we will establish a new era of expanded collaboration with Google that will further enhance our Silicon Valley connections," said Ames Center Director S. Pete Worden.

"This major expansion of NASA Research Park supports NASA's mission to lead the nation in space exploration, scientific discovery and aeronautics research."

"This long-term lease agreement is

a key component of Google's strategy for continued growth in Silicon Valley," said David Radcliffe, Google's vice president of real estate and workplace services. "We believe this collaboration between Google, NASA and the city of Mountain View is emblematic of the mutually beneficial partnerships that can be created between the public and private sectors."

Under the terms of this enhanced-use lease (EUL), Google will pay

NASA an initial base rent of \$3.66 million per year. This rate is based on appraisals establishing fair market value of the land. NASA will use the proceeds to cover the full cost of the lease and the balance may be used for capital revitalization and improvements of the real property assets at Ames.

The 40-year lease provides for periodic escalations and adjustments of
continued on page 8

NASA tests lunar robots and spacesuits on Earthly moonscape

BY KELLY HUMPHRIES AND RACHEL PRUCEY

Conditions on the moon will be harsher, but prototype NASA robotic vehicles braved sand storms and unprecedented temperature swings

return to the moon by 2020, begin to explore the lunar surface, and set up outposts," said Test Director Bill Bluethmann of NASA's Johnson Space Center in Houston.
continued on page 11



NASA photo by Sean Smith

NASA gathered some of its most promising new concepts for living and working on the surface of the moon for a series of field tests at Moses Lake sand dunes, Wash., in early June. Robots, rovers and lunar planners simulated lunar exploration, site serverys and outpost construction.

this month on sand dunes near Moses Lake, Wash., to prepare for future lunar expeditions. Teams from seven NASA centers and several universities conducted the tests from June 2-13.

"The goal was to gain hands-on experience with specific technical challenges anticipated when humans

On the Inside . . .

- Page 2 - NASA develops world's highest resolution visualization system
- Page 4 - Ames Team wins Collier Trophy
- Page 5 - Presidential/NASA Honor awards
- Page 6 - Space Act Awards presented
- Page 13 - Classifieds

NASA develops world's highest resolution visualization system

BY MICHAEL MEWHINNEY AND JILL DUNBAR

The power to visualize highly complex information in a way that's easier for the human mind to grasp is taking a giant leap forward with the advent of NASA's new hyperwall-2 system unveiled June 25 at Ames.

Developed by scientists and engineers in the NASA Advanced Supercomputing (NAS) Division at Ames, the 128-screen hyperwall-2, capable of rendering one quarter billion pixel graphics, is the world's highest resolution scientific visualization and data exploration environment. The new tool enables scientists to quickly explore datasets that otherwise would take many years to analyze.

The 23-foot-wide by 10-foot-tall liquid crystal display wall is being used to view, analyze and communicate results from NASA's high-fidelity modeling and simulation projects supporting the safety of new space exploration vehicle designs, atmospheric re-entry analysis for the space shuttle, earthquakes, climate change, global weather and black hole collisions.

"The hyperwall-2 offers a supercomputer-scale environment that is truly up to the task of visualization and exploration of the very large datasets routinely produced by NASA supercomputers and instruments," said Bryan Biegel, NAS deputy chief. "The system also will be used to get highly detailed information on how NAS supercomputers are operating, enabling staff to quickly and precisely diagnose problems or inefficiencies with the supercomputers or the software running on them."

Designed and developed by the NAS visualization team in partnership with Colfax International, Sunnyvale, the system is powered by 128 graphics processing units and 1,024 processor cores, with 74 teraflops (one teraflop equals one trillion floating point operations per second) of peak processing power and a data storage capacity of 475 terabytes (one terabyte equals one trillion bytes). The hyperwall-2 allows researchers to quickly determine trends across an array of related simulation results, or to view a single



Timothy "Tim" Sandstrom, of Computer Sciences Corporation seen here operating the 128-screen hyperwall-2, which has the ability to render one quarter billion pixel graphics and is the world's highest resolution scientific visualization and data exploration environment.

large image or animation. It would take nearly 600 video game consoles to equal the hyperwall-2's graphics processing capabilities.

"We are proud to continue partnering with NAS as it offers advanced, innovative solutions for high-performance computing," said Gautam Shah, chief executive officer, Colfax International. "As NASA Ames successfully responds to support the visualization and data analysis needs of researchers to maximize the understanding of scientific results, Colfax International is pleased to be part of the hyperwall-2 visualization cluster project," Shah added. Colfax previously built a "mini" hyperwall for NAS used for demonstrations at national conferences.

With a direct, high-speed connection from the supercomputers at NAS, including the Columbia supercomput-

er, hyperwall-2 will enable NASA to meet its increasing needs for advanced visualization and analysis of large, high-dimensional simulation results.

With more than 100 times the processing power of the original 49-screen hyperwall developed in 2002 by the NAS visualization team, hyperwall-2 will be integrated with the team's software tools. This includes a state-of-the-art concurrent visualization framework to provide NASA scientists and engineers with ultra-high resolution images and videos to explore results of their research and analysis.

For more about the NASA Advanced Supercomputing Division, visit:<http://www.nas.nasa.gov>

NASA photos by Eric James

Moon-bound NASA spacecraft passes major preflight tests

BY JONAS DINO

Engineering teams are conducting final checkouts of the Lunar CRater Observation and Sensing Satellite, known as LCROSS, that will take a significant step forward in the search for water on the moon.

The mission's main objective is to confirm the presence or absence of water ice in a permanently shadowed crater near a lunar polar region. A major milestone, thermal vacuum testing of the LCROSS spacecraft, was completed June 5 at the Northrop Grumman facility in Redondo Beach, Calif.

To simulate the harsh conditions of space, technicians subjected the spacecraft to 13.5 days of heating and cooling cycles during which temperatures reached as high as 230 degrees Fahrenheit and as low as minus 40 degrees. Previous testing for the LCROSS spacecraft included acoustic vibration tests. Those tests simulated launch conditions and checked mating of connection points to the Atlas V rocket's Centaur upper stage and the adapter ring for the Lunar Reconnaissance Orbiter, known as LRO.

The satellite currently is undergoing final checkout tests. After all tests are complete, the LCROSS spacecraft will be prepared for delivery to NASA's Kennedy Space Center in Florida for launch processing and integration onto the Atlas V as a secondary payload to LRO. Both spacecraft are scheduled to launch from Kennedy in late 2008.

"The spacecraft steadily has taken shape since Ames delivered the science payload in January," said Daniel Andrews, LCROSS project manager at Ames. "It is a testament to the hard work, perseverance and expertise of the NASA and Northrop Grumman teams that the spacecraft has completed these critical tests ahead of schedule."



NASA photos courtesy Northrop Grumman

The Lunar CRater Observation and Sensing Satellite is gently maneuvered into the Thermal Vacuum Chamber at the Northrop Grumman Facility, Redondo Beach, Calif. During the tests, the spacecraft was subjected to heating and cooling cycles to simulate the harsh conditions in outer space. Thermal Vacuum is the final milestone before being certified for space flight.

After launch, the LCROSS spacecraft and the Atlas V's Centaur upper stage rocket will execute a fly-by of the moon and enter into an elongated Earth orbit to position the satellite for impact on a lunar pole. On final approach, the spacecraft and the Centaur will separate. The Centaur will strike the surface of the moon, creating a debris plume that will rise above the surface. Four minutes later, LCROSS will fly through the debris plume, collecting and relaying data back to Earth before impacting the lunar surface and creating a second debris plume. Scientists will observe both impacts from Earth to gather additional information.

LCROSS is a fast-paced, low-cost mission that is leveraging existing NASA systems, commercial-off-the-shelf components and the spacecraft

design and development expertise of integration partner Northrop Grumman Space Technologies. The LCROSS and LRO missions are components of the Lunar Precursor Robotic Program at NASA's Marshall Space Flight Center, Huntsville, Ala. The program manages pathfinding robotic missions to the moon for the Exploration Systems Mission Directorate at NASA Headquarters in Washington.

For more information about the Lunar Crater Observing and Sensing Satellite, visit: <http://lcross.arc.nasa.gov>.

For an overview of the Lunar CRater Observation and Sensing Satellite (LCROSS) colloquium presented by Jennifer Heldmann, see page 4.

NASA Ames team wins celebrated Collier Trophy

BY JONAS DINO

NASA is part of a team that received one of the most prestigious awards in aviation on June 12.

Judges for the Robert J. Collier Trophy, awarded by the National Aeronautic Association, chose the Automatic Dependent Surveillance-Broadcast, or ADS-B, team of public and private groups to receive the 2007 honor.

Instead of relying on radar, ADS-B uses Global Positioning System satellite information to give pilots and controllers highly accurate traffic data, as well as displays that update in real time. The system also will give pilots access to weather services, terrain maps and flight information services. Government and industry leaders have worked for more than a decade to develop and implement this technology for the

next generation of air traffic management.

According to the selection committee, "ADS-B is a ground-breaking effort for next-generation airborne surveillance and cockpit avionics. Its implementation will have a broad impact on the safety, capacity and efficiency of the national airspace system."

Researchers at NASA's Ames and NASA's Langley Research Center, Hampton, Va., were part of the extensive team that developed and tested ADS-B.

"NASA is proud to have been a part of ADS-B research and development," said Karlin Roth Toner, Airspace Systems Program director for the Aeronautics Research Mission Directorate at NASA's Headquarters in Washington. "This is the kind of research NASA specializes in and

that will help transform the air traffic control system to satisfy future traffic demands."

Established in 1911, the Collier Trophy is awarded for "the greatest achievements in aeronautics or astronautics in America, with respect to improving the performance, efficiency and safety of air or space vehicles, the value of which has been thoroughly demonstrated by actual use during the preceding year."

The trophy has been given to many of America's greatest aerospace pioneers, including Orville Wright and Neil Armstrong.

This is the 21st time research and development projects that included NASA or its predecessor agency, the National Advisory Committee for Aeronautics, have received a Collier Trophy.

Heldmann presents updates to the LCROSS mission

Recently, Jennifer Heldmann presented a Director's Colloquium

entitled, "Prospecting for Water Ice on the Moon: NASA's Lunar CRater

Observation and Sensing Satellite (LCROSS) Mission.

Heldmann is a scientist in the Space Science and Astrobiology Division at Ames. Her current research interests lie in studying the Earth, moon and Mars. For the LCROSS mission she serves on the science team, payload team and as the observation campaign coordinator.

LCROSS is scheduled for launch in late 2008 and seeks to confirm the presence or absence of water ice in a permanently shadowed crater near one of the moon's poles. The mission is managed by NASA's Ames Research Center in cooperation with Ames' spacecraft and integration partner, Northrup-Grumman.

Heldmann gave an overview for the rationale and goals for the mission, mission design and opportunities for observations as well as provided updates on site selection activities and progress on the coordination of the ground-and space-based observation campaign. She also highlighted Ames activities supporting the mission.



NASA photo by Eric James

Jennifer Heldmann spoke recently at the center about the Lunar CRater Observation and Sensing Satellite (LCROSS) Mission, giving an overview of the mission goals as well as updates to the mission.

2008 Presidential Rank and NASA Honor Awards presented

NASA Ames employees were honored this month during the 2008 Presidential Rank and NASA Honor Awards Ceremony held in the main auditorium (Bldg. N-201).

Ames presented Presidential Rank and NASA Honor Awards to 34 employees who were selected for individual awards, and to the managers of the 23 groups that were selected for the NASA Group Achievement Award. The names of the honorees are listed below.

2008 Presidential Rank and NASA Honor Awards

Presidential Rank of Meritorious Senior Professional

Daniel J. Rasky

Presidential Rank of Meritorious Executive

Lewis S.G. Braxton III
Thomas A. Edwards
Carol J. Russo

Distinguished Service Medal

Bernard Laub

Equal Employment Opportunity Medal

Laura W. Doty
Michel Liu

Exceptional Achievement Medal

Thomas S. Alderete
Soheila Dianati
Douglas R. Fraser
Susan A. Kalb
Thomas R. Norman
Mark Sumich
Marilyn Vasques
Jerry C. Yan

Exceptional Administrative Achievement Medal

Linda S. Hellman

Exceptional Engineering Achievement Medal

Robert E. McMurray
Michael J. Wright



NASA photo by Dominic Hart

Awardees at the 2008 Presidential Rank and NASA Honor Awards Ceremony held at Ames in mid June.

Exceptional Public Service Medal

Gregory W. Condon
Shelleen Lomas
Kristina Skokova

Exceptional Service Medal

Mark A. Beskind
Dean P. Giovannetti
Kalmanje S. Krishnakumar
Teresa L. Kurtz
Lawrence E. Olson
Sherri A. Shore
Thomas N. Trower
Alexander M. Valdez

Outstanding Leadership Medal

Vincent Albert
Thomas A. Edwards
James J. Reuther
Michael G. Skidmore
Carol R. Stoker

Group Achievement Award

Ames STS-118 Aerothermal Analysis Team
Ames Unitary RAM Block II Wind Tunnel Test Team
CBTM-02 Animal Enclosure Module Team
Constellation Enabled Mission: NEO
Constellation PRACA Team
Foton-M3 Payload Team

Human-Robot Site Survey Project Team

Joint Flight Demonstration Test (JFDT) Team

Lunar Lander Handling Qualities Simulation Team

Mariana Development Team

MSL Heatshield Team

NAS Facilities Engineering Team

NAS Security Team

NASA Ames Disaster Assistance & Rescue Team

NASA Ames Reimbursable Realignment Team

NASA Supercomputing Support Services SEB

SPEGIS Project Team

TOOWiLD Team

Tropical Composition, Cloud and Climate Coupling

Wildfire Research and Applications Partnership

Public Service Group Achievement Award

ELORET CEV and MSL Team
Planners Collaborative, Inc.
UARC Team

One NASA Peer Award

Ares 1 Aerodynamics Team

Space Act Awards presented for scientific, technical contributions

The FY 2008 Space Act Board Award ceremony was held at Ames on June 18. Space Act Board Awards are made by the NASA Inventions and Contributions Board based on their scientific or technical contributions sponsored, adopted, supported or used by NASA which are significant to aeronautics and space activities. For further information about the board, visit <http://icb.nasa.gov/>

The following Ames technologies and software programs were recognized at the ceremony:

ARC-12011, Process to Prepare Uniform Low Density Structural Ceramic Ablator Systems

Daniel Rasky, NASA ARC
Huy Tran, NASA ARC
William Henline, Retired
Ming-ta Hsu, Retired
Salvatore Riccitiello, Retired

ARC-14289, Real-Time Update of Fault-Test Dependencies of Dynamic Systems/A Comprehensive Toolset for Model-Based Health Monitoring and Diagnostics

Somnath Deb, QSI
Sudipto Ghoshal, QSI
Venkat Malepati, QSI
Fang Tu, QSI
Charles Domagala, QSI
Roshan Shrestha, QSI
Krishna Pattipati, QSI
Ann Patterson-Hine, NASA ARC
Gordon Aaseng, NASA ARC
Dwight Sanderfer, NASA ARC
Eric Barszcz, NASA ARC
Michael Battaglia, NASA HQ
Carlos Garcia-Galen, NASA KSC
Jeremy Johnson, RIACS (ARC)
Peter Robinson, SAIC (ARC)

ARC-14652, 3D Laser Scanner

Joseph Lavelle, NASA ARC
Stefan Schuet, NASA ARC

ARC-15022, Data-Parallel Line Relaxation Code (DPLR)

Michael Wright, NASA ARC
David Hash, NASA ARC
James Brown, NASA ARC
Ryan McDaniel, NASA ARC
Matt MacLean, CUBRC
David Saunders, ELORET
Chun Tang, ELORET
Kerry Trumble, ELORET



Huy Tran (center), recipient of the Exceptional Space Act Board Award, 2007 NASA Government Invention of the Year for "Light Weight Ceramic Ablators and Process of Making the Same," at the recent Space Act Board Award ceremony held at Ames. Next to Tran is Eugene Tu, director of Exploration (right) and Steven Zornetzer, associate director for Institutions and Research at Ames (left). Fellow awardees not pictured are Daniel Rasky, Ming-ta Hsu, William Henline and Salvatore Riccitiello.



Exceptional Space Act Board Award, 2007 NASA Software of the Year Co-Winners, for the software Data Parallel Line Relaxation Code (DPLR) version 3 were honored in June. Shown (left to right) front row are Kerry Trumble, David Hash and James Brown. Back row (left to right) are Michael Wright and David Saunders. Shown at right is Ames Center Director S. Pete Worden, who presented the awards. Team members not pictured are Matt MacLean, Ryan McDaniel and Chun Tang.

NASA photos by Dominic Hart

ARC-15058, Inductive Monitoring System - System Health Monitoring Software that Learns System Behavior from Data (IMS)

David Iverson, NASA ARC

ARC-15568, Stochastic Electromagnetic Design And Optimization Method (ADSS: AI Software That Automatically Designs And Optimizes Spacecraft Systems)

Jason Lohn, NASA ARC
Greg Hornby, UC Santa Cruz
Derek Linden, JEM Engineering, LLC

ARC-15725, Software For Remote Monitoring And Training Of Human Physiological Responses

Patricia Cowings, NASA ARC
William Toscano, NASA ARC
Soumyadipta Acharya, John Hopkins University
Nemath Syed Shah, Case Western Reserve
Bruce Taylor, University of Akron

ARC-16025, Chimera Grid Tools (version 2.0)

William Chan, NASA ARC
Stuart Rogers, NASA ARC
Shishir Pandya, NASA ARC
Pieter Buning, NASA LaRC
Steven Nash, Sun Microsystems
Robert Meakin, US Army
David Boger, Penn State University

Des Marais named Fellow of American Geophysical Union

David Des Marais of the Exobiology Branch was recently elected Fellow



NASA photo

David Des Marais of Ames recently was elected Fellow of the American Geophysical Union.

This honor is conferred upon not more than 0.1 percent of all AGU members in any given year.

Des Marais received his Ph.D. in geochemistry from Indiana University in 1974 and has been a staff scientist in exobiology at Ames since 1976. He has investigated the geochemistry of carbon in lunar samples, meteorites, oceanic basalts and ancient sediments. He currently studies the biogeochemistry of microbial communities in coastal marine environments and participates in missions searching for evidence of past habitable environments on Mars. Des Marais has authored or co-authored more than 160 peer-reviewed articles and book chapters.

He has been the principal investigator of the Ames team of the NASA Astrobiology Institute since 1998. He is a lead for Long Term Planning with the Science Operations Working Group of NASA's Mars Exploration Rover mission. He also is a member of the CRISM (infrared spectrometer) team of NASA's Mars Reconnaissance Orbiter mission and the CheMin team of NASA's 2009 Mars Science

Laboratory mission. He chaired and co-chaired the committees that revised the NASA Astrobiology Roadmap in 2003 and 2008, respectively.

Des Marais was the first to realize that studies of carbon cycling over billions of years of Earth history would have to address exchanges of carbon between the crust and the mantle. Using novel techniques, he found that previously published analyses were inaccurate. His numerous follow-up papers are still widely cited and provide some of the best-available summaries of what can and cannot be said about the cycling of carbon in environments on early Earth.

In addition to the American Geophysical Union, Des Marais also is a Fellow of the Geochemical Society, the European Association of Geochemistry, the International Society for the Study of the Origins of Life and the California Academy of Sciences.

Wong honored with Federal Employees of the Year award

Robert Wong of NASA Ames recently received the Federal Employees of the Year (FEYA), Trades and Crafts award. Wong coordinated and managed the maintenance of the facilities used for the evaluation of Shuttle Wing Leading Edge Repair concepts. He directs a staff of five engineering technicians at the center and his enthusiasm, dedication and attention to detail were crucial to the continued operation of the Arc Jet Facilities which were required for critical concept testing. From left to right, Federal Employees of the Year (FEYA) award judge Joanne Haggerty, Federal Executive Board chair Cathy Dunlap, Ames' Robert Wong and FEYA judge David Coyle.



photo courtesy of Federal Executive Board

State Treasurer Bill Lockyer tours Ames



California State Treasurer Bill Lockyer recently toured Ames, visiting the Advanced Supercomputing Facility and Vertical Motion Simulator. Lockyer also discussed Earth Sciences with Ames Earth Science Division Chief Steve Hipskind. Seen here, at the Supercomputing facility during the tour are: Lockyer (second from left, back); Supercomputing Division Chief (Acting) Rupak Biswas (front middle); and Lockyer's guests Peter Bynoe and Jim Reynolds.

photo by Nick Bonifas

NASA, Google announce lease at Ames Research Center

continued from front page

rent. Google may extend the lease for three 10-year terms. After that, NASA and Google may agree to extend the lease two additional 10-year terms. If all extensions are exercised, the lease term will be a total of 90 years. NASA will retain control over the project during its construction phase, including approving the design, issuing building permits, conducting inspections and monitoring construction.

Construction will proceed in three phases. The first phase is planned to begin by the end of September 2013, the second phase by 2018 and the third by 2022. While the majority of the development will consist of office and R&D space, Google also plans to construct company housing and amenities such as dining, sports, fitness, child care, conference and parking facilities for its employees, as well as recreation and park facilities and infrastructure improvements for NASA's use.

This announcement is the latest in a series of collaborations dating back to September 2005, when NASA and Google announced plans to work together on a variety of technology-focused R&D activities. NASA and Google signed a memorandum of understanding that year, launching negotiations for this development in NASA Research Park. Located at Ames, NASA Research Park is a world-class, shared-use educational and research-and-development campus.

Since signing the memorandum of understanding in 2005, NASA and Google have begun collaboration on several joint projects. The Planetary Content project develops software that makes it easier for the science community to publish planetary data via the Internet. This project has already provided high-resolution lunar imagery and maps to the Google Moon™ program and resulted in the "NASA" layer in Google Earth.

Similarly, the Global Connection project enhances the "National Geographic" layer in Google Earth by embedding geo-referenced stories and images from around the world. The Disaster Response project develops prototype software tools to help improve first response to large-scale natural disasters.

Google's innovative search technologies connect millions of people around the world with information

every day. Founded in 1998 by Stanford University Ph.D students Larry Page and Sergey Brin, Google today is a top web property in all major

markets. Google is headquartered in Silicon Valley with offices throughout the Americas, Europe and Asia.

Boyd discusses NASA's past 50 years



NASA photo by Dominic Hart

Jack Boyd, who currently serves as senior advisor to the Ames center director and senior advisor for history and also serves as the center Ombuds, recently presented a director's colloquium entitled, "Reflections on NASA's 50th Anniversary: The Giants on Whose Shoulders We Stood," where he discussed the history of NASA and Ames.

Whalley describes hemispherical laser detection and ranging sensor research



NASA photo by Eric James

Mathew Whalley, a researcher with the US Army Aeroflightdynamics Directorate, presented an Aeronautics Technical Seminar June 19 at Ames entitled, "Design and Flight Test Results for a Hemispherical LADAR Developed to Support Unmanned Rotorcraft Urban Operations Research." Whalley described his research about a newly developed hemispherical laser detection and ranging sensor. This research supports field-testing of algorithms for landing site selection and obstacle field navigation. Results for flight tests with a calibration target and obstacle field, and for mapping of a large structure were presented, as well as results for using the sensor in conjunction with previously developed autonomous landing site selection software. In addition to the LADAR results, he also gave a brief overview of the Autonomous Rotorcraft Project.

Thousands visit Ames' interactive exhibit at local festival

photos by Astrid Olson



Members of the community got to see Mars up close and in 3-D when they visited the NASA tent at the Sunnyvale Art and Wine Festival June 7-8. Ames volunteers passed out 3-D glasses, discussed the Phoenix mission that recently landed on Mars, and shared information about the many contributions that NASA Ames has made to the agency over the past 50 years.



photo by Todd Hartmann



photo by Ernie Fretter

Redesigned Moffett Field Golf Course challenges Ames golfers

By BETTY LARSON AND DAVID MORSE

If you haven't played The Golf Club at Moffett Field lately, it's definitely time to pay a return visit. You and your special guests are in for a real treat.

The old course has undergone a major redesign that has thoroughly transformed the place. Gone are the pleasant but uniformly flat fairways

and current and ex-military members can call ahead to the Golf Shop (650) 603-8026 to reserve a tee time, learn access information and make arrangements for themselves and their special guests. Best of all, the course still offers old-world affordability with fees ranging from an incredibly low, super twilight rate of \$10 to only \$32 during peak weekend hours. Members of the

The golf course can host groups up to 144 golfers for shotgun tournaments and fundraisers. All tournaments and special events can be booked up to one year in advance by calling sales and marketing director, Betty Larson, at (650) 254-1808. New Thursday after-work, nine-hole scramble events for NASA employees, contractors, partners and invited guests, and a special Sunday afternoon program for retired Bay Area military golfers are being planned for the coming months.

The club is a full-service venue that includes the 18-hole championship course, electric golf cars, restaurant, cocktail lounge, tax-free Golf Shop, outdoor deck, driving range and the new putting and chipping greens. Just opened in June, this practice area provides an ideal place to perfect challenging sand, chip and pitch shots. It can also be set up as a nine-hole chip-and-putt course for special, fun events.

The Golf Shop has an excellent selection of golf merchandise available at very reasonable prices. The selection includes men's and women's golf clubs, putters, apparel, shoes, golf balls and accessories, including handheld GPS systems, gloves and an array of NASA-logo items. Merchandise prices compete very favorably with golf retail stores or other local golf course shops. The Golf Shop has both demonstration and used clubs available for rent; it also offers golf club repair services.

For those looking to relax and just take in the sights, the golf course dining room looks out on the new practice area and the tee for the tenth hole. It can be reserved to host after-work events for up to 100 people, as can the outdoor deck and gas barbecue, which are available for even larger parties. The recently renovated grill offers a varied menu and is open to the public for breakfast, lunch and snacks. Beer, wine, cocktails and appetizers can be purchased at the bar. All are offered at very reasonable prices.

Come visit the Golf Club at Moffett Field real soon, before the "buzz" gets out and tee times are at a premium. From general manager Mike Hill on down, you will find the entire staff very friendly and accommodating. And you don't want to miss the exciting, new golf experience just waiting for you to come and take on the challenge.



photo by Mike Hill

Bottom left photo: this aerial view of The Golf Club at Moffett Field shows holes six and seven running parallel to the San Francisco Bay (on the right), with the dog leg of hole number eight running across the center, and holes two and three in the right and middle foreground. Top left photo: the bunkers and extended green of the new pitch-and-putt practice area are visible in the foreground set against the backdrop of the Clubhouse, Golf Shop and bar and grill. Top right photo: a small section of the extended selection of golf-related products and NASA merchandise available at very competitive prices at the Golf Shop is displayed.



NASA photo by Eric James



NASA photo by Eric James

that offered little more than a "walk in the park," replaced by a course that offers variety, fun and a real golf challenge.

After 18 months of renovation under the direction of the Ames Exchange Council, the old course has been modernized and upgraded. It now features meandering fairways, large sand features and elevated tees. Plus there is a terrific new practice area designed to improve your putting and chipping game, and refurbished and strategically located car paths that vastly improve access and transport. What hasn't changed are the beautiful location and spectacular views that have always made the course a popular and attractive destination. Not to mention the red tail hawks, burrowing owls and vast array of other bird and animal species that make the place a veritable wildlife preserve.

Playing the Golf Club at Moffett has never been easier. Federal employees and contractors, NASA partners

military and federal employees and contractors are eligible for discounted rates during off-peak hours.

In a twist of irony, the original, very-flat course was named the 'Hill Course' in honor of Captain Arthur S. Hill, the Commanding Officer at Moffett when the facility opened in 1959. Designed by Bob E. Baldock, the course began life as a nine-hole venue before expanding to 18 holes 10 years later. The recent renovations by renowned golf-course architect Algie Pulley have added an enhanced irrigation system, dramatically recontoured terrain, concrete car paths, bunker restoration and greens modification. The course remains at par 72, playing to a maximum of 6,517 yards from the challenging blue tees.

The Golf Club at Moffett is the perfect venue for employee recreational activities, whether it's a golf tournament or league, bucket of balls at the driving range, putting contest, barbecue, luncheon or after-work social.

NASA tests lunar robots and spacesuits on Earthly moonscape

continued from front page

NASA's Human Robotic Systems Project, part of the agency's Exploration Technology Development Program, focused on human and robotic mobility systems for the moon, but also looked at communication and command and control systems that will connect the explorers with Earth and each other. The Moses Lake dunes provided a wide variety of soil consistencies and terrain that allowed the team to put prototype scout robots,

and panoramic 3-D terrain models. One rover used a ground-penetrating radar to assess subsurface structures. The other used a 3-D scanning laser system known as LIDAR to create topographic maps. The scout robots are designed to perform highly repetitive and long-duration tasks, such as site mapping and science reconnaissance.

"It's as close as we can get in a terrestrial environment to the lunar environment," said Brian Wilcox, principle investigator for the All-Terrain Hex-Legged Extra-Terrestrial Explorer robot, known as ATHLETE, at NASA's Jet Propulsion Laboratory (JPL) in Pasadena, Calif.

JPL tested two ATHLETE cargo-moving rovers. Each rover has six legs capable of rolling or walking over extremely rough or steep terrain. This will allow robotic or human missions on the

lunar truck, and advanced spacesuit designs that could be used to greatly expand the exploration range of human explorers. NASA's new concept for a lunar truck was built in less than a year with unique features that allow each of its six wheels to move independently, giving the vehicle the ability to drive in any direction. Human drivers stood in turrets on the trucks that can pivot 360 degrees, contributing to easy steering.

To practice soil-moving techniques for the moon, Kennedy developed a bulldozing blade for the lunar truck, named the Lunar Attachment Node for Construction Excavation, or LANCE. A lightweight, composite technology such as LANCE will be used on the moon to clear landing pads and protect outposts from dust and debris generated by arriving spacecraft. The tests will help NASA evaluate the feasibility of excavating lunar soil, or regolith, for landing pads, blast protection berms, pathways, foundations and lunar operations areas.

NASA's Langley Research Center of Hampton, Va., demonstrated a lunar surface crane that could be used to lift and reposition heavy cargo, including modules used for crew quarters. The Lunar Surface Manipulator System is a lightweight lifting and precision positioning device that could give astronauts a helping hand during early outpost construction and follow-on operations. The crane can be operated autonomously, remotely or manually in backup mode, and can be reconfigured to perform different tasks. NASA's Goddard Space Flight Center of Greenbelt, Md., provided lunar payload mockups that were used with the lunar crane to demonstrate payload handling operations.

Participants in the June tests will evaluate their data and prepare for additional tests in October at another site, yet to be announced, with moon-like conditions.

For an image gallery and video from the tests, as well as more information about the work NASA is doing to return to the moon, visit: <http://www.nasa.gov/exploration>



NASA photo by Sean Smith

All-Terrain Hex-Legged Extra-Terrestrial Explorer (ATHLETE) robots, seen here during the recent Moses Lake demonstration in Washington state earlier this month, could be the RV of choice for future explorers. Its multi-wheeled dexterity could allow robots or humans to load, transport, manipulate and deposit payloads to essentially any desired site on the lunar surface. NASA's Jet Propulsion Laboratory led a NASA-industry team to develop ATHLETE.

rovers, cargo carriers, cranes and spacesuits through tests in a harsh and changing environment.

The prototype tests will be used to inform developers of specific requirements needed in lunar surface support systems for the Constellation Program. The program is building the launch vehicles and spacecraft that will take a new generation of explorers to the moon, as well as lunar landers, habitats, life support systems, vehicles and robots to support them. A ground control team located thousands of miles away at Johnson operated the robots and coordinated the movements of the suited explorers.

NASA's Ames tested two K10 rovers that surveyed simulated lunar landing sites and built topographic

surface of the moon to load, manipulate, deposit and transport payloads to desired sites. The team includes members from Johnson, Ames, Stanford University and the Boeing Co. of Chicago.

NASA's Glenn Research Center in Cleveland, and Carnegie Mellon University of Pittsburgh tested an autonomous drilling rover that could be used to search for valuable resources under the lunar surface in the moon's polar regions. The team also includes members from Ames, Johnson, NASA's Kennedy Space Center, the Canadian Space Agency and the Centre for Advanced Technology Inc. in Sudbury, Ontario.

Engineers from Johnson tested a crew mobility chassis prototype, or

Ames Ongoing Monthly Events Calendar

Ames Amateur Radio Club, third Thurs., of ea. month, 12 noon, N-T28 (across from N-255). POC: Michael Wright, KG6BFBK, at ext. 4-6262.

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

Ames Bicycling Club, every third Wednesday of each month, 12 noon - 1 p.m., Bldg. N-245 Auditorium. POC: Julie Nottage at jnottage@mail.arc.nasa.gov, ext. 4-3711.

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

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

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

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

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

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

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

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

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

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

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

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

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

Ames emergency announcements

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

Safety Data

NASA-Ames Occupational Illness-Injury Data for Calendar Year-to-Date 2008 Jan. 1, 2008 - May 31, 2008

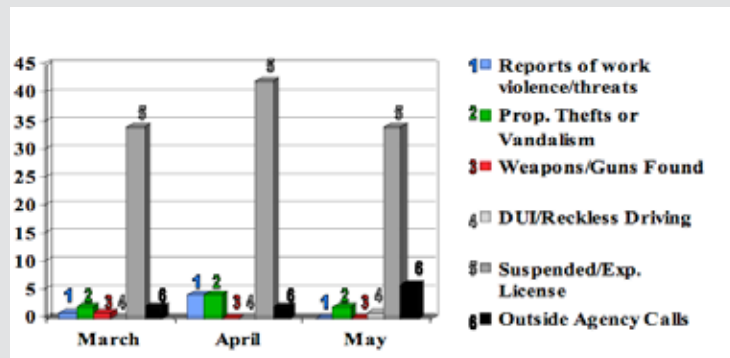
	Civil Servants	Contractors
First aid cases	12	8
Lost Workday cases	1	0
Recordable cases	0	3
Restricted duty days	0	2

Above data are as of May 31, 2008. May be subject to slight adjustment in the event of a new case or new information regarding an existing case.

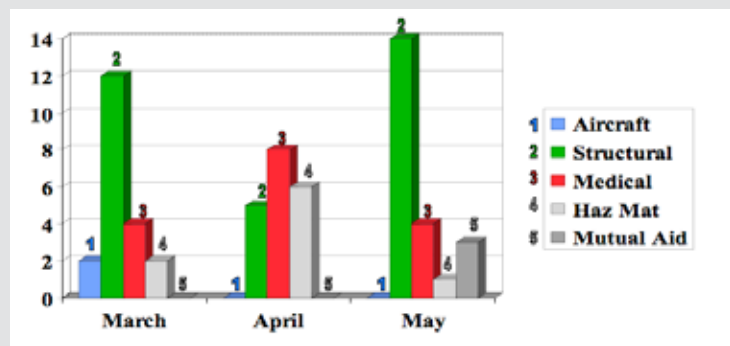
Protective Services monthly activity

A statistical summary of activities of the Protective Services Division's Security/Law Enforcement and Fire Protection Services units for the month of May 2008 is shown below.

Security/Law Enforcement Activity



Fire Protection Activity



Ames Classifieds

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

Housing

Roommate needed to share furnished 2bd/1ba apartment in Mtn. View. On-site laundry, dishwasher, patio and covered parking. Rent \$675. Robin (510) 610-8604.

Room for rent, private bed and bath. 12-foot-by-12-foot room w/window. Available July 1. \$750 per mo. Use of kitchen and laundry facilities in condo. Please provide copy of credit report. Call (650) 255-1977.

Transportation

'86 Porsche 944, maroon red exterior, 4 door, 5-speed manual transmission. 155,000 mls, good condition, well-maintained, fun to drive, gives 22 mpg, has recent smog certificate and maintenance records since 1998 when we bought it from the original owner. \$1,550. Anupa (650) 862-2869.

Miscellaneous

Orbit-Trak exercise machine. Arm poles may be fixed or stationary. Electronic display for distance traveled, calories burned and elapsed time. \$50. Between 6 p.m. and 8 p.m. Call (650) 962-9031.

Astrogram deadlines

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

For All Your Supply Needs On Installation

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www.aibexpress.com

Exchange Information

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

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

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

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

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

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

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

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

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

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

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

NASA Lodge (N-19) 603-7100

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

Ames Swim Center (N-109) 603-8025

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

Ongoing Vacation Opportunities

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

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

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

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

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

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

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

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

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

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

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

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

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

Ames Cat Network

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

The NASA Lodge

Rooms starting at \$45 a night.

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

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

Let Us Welcome You!

Call (650) 603-7101

<http://naccenter.arc.nasa.gov/ldging.html>



Ames Child Care Center to host 12th annual charity golf tournament

BY SAVVY VERMA

The Ames Child Care Center (ACCC) will host its 12th Annual Charity Golf Tournament on Friday, Aug. 1, 2008, at The Golf Club at Moffett Field. Registration and lunch will begin at noon, followed by a shotgun start at 1 p.m. There will be hors d'oeuvres and a raffle prize drawing immediately following the tournament.

Proceeds from this tournament will be used to purchase equipment for outdoor classroom activities and playground structures and landscaping.

The cost of registration (due July 25) will be \$75 per player (teams of four are \$300). The registration fee includes the round of golf, bag lunch before the tournament and one raffle ticket per player. Additional raffle tickets will be available the day of the tournament. Electric carts are available

on a first-come, first-served basis at an additional cost of \$25 per cart. The format for the tournament will be a four-person scramble (best shot from your team used for each stroke). Prizes will be awarded to the teams with the lowest three net scores and the lowest gross score. There will be prizes at select holes for the "longest drive" and "closest to the pin."

The ACCC is a non-profit child care center and preschool located at NASA Ames and accredited by the prestigious National Association for the Education of Young Children (NAEYC). The ACCC has been in operation since 1986, and currently serves over 100 families from Ames (civil servant and contractor) and Moffett Field and the surrounding community. The tuition paid by the parents covers salaries and operational costs only. All other costs, such as the playground improvements, staff



appreciation, and other activities are covered by fundraising events, such as the ACCC Golf Tournament.

Registration forms will be available for download from the ACCC web site: <http://acc.arc.nasa.gov>. Registration forms can also be requested by contacting Savvy Verma: savita.a.verma@nasa.gov or child-care@mail.arc.nasa.gov.

What's on InsideNASA . . .

NASA Deputy Administrator Shana Dale's corner on InsideNASA this month features an article entitled, "New Pathways to Prevention through Better Medical Imaging." Following is an excerpt from the article.

Early detection can make a big difference when it comes to dealing with cancers and heart disease. But that's not why Dr. James Tilton, a scientist at NASA's Goddard Space Flight Center created Hierarchical Segmentation software. Rather, he was developing a technology for remote sensing - a software tool for getting more detailed and accurate information from satellite images.

That changed when employees from Bartron Medical Imaging LLC heard about it. The company had been trying to build a product that could pick fine details out of complex medical images, thereby improving patient diagnoses, and they realized that NASA's new technology was the key. After securing the necessary licenses, Bartron successfully applied NASA's technology to medical imaging, creating the Med-Seg™ unit.

A clinician sitting at a Med-Seg unit can receive a variety of medical images - CT scans, ultrasounds, dental X-rays and other imagery - and then segment the images to see features not previously visible. The clinician also

can isolate specific areas of interest and compare them to reference images, looking for what is normal . . . and what is not.

This technology may allow the small signs of developing diseases to be detected sooner, reducing the costs of exploratory surgery and the suffering of full-blown disease. Detection may be even better if Bartron and NASA succeed in their new efforts to develop a three-dimensional version of the imaging software.

To learn more about this technology, visit: http://insidenasa.nasa.gov/nasa_stories/Medical_Imaging.html


Volunteer teachers sought for science classes

As part of the Partnership for Student Success in Science project at San Jose State University, engineers and scientists are trained and placed in science classrooms in Silicon Valley. RESEED (Retirees and others Enhancing Science Education through Experiments and Demonstrations) was started at Northeastern University in 1991 and expanded to the Silicon Valley area in 1998.

This program has placed many volunteers with local classrooms

ever since. All who are interested in energizing young people about science and engineering, and looking for a personally rewarding activity, please consider joining our next cohort of volunteers.

For more information, contact Dr. Peter K. Mueller, (650) 303-6893, pklausm@mac.com, or Professor Kurt McMullin, College of Engineering, (408) 924-3855, mcmullin@email.sjsu.edu



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

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