

Ames astrobiologist seeks clues to origin of life

An Ames scientist has shown that organic chemistry is abundant in the universe, implying that carbon-based life is possible beyond Earth's boundaries.

In a paper published in the December 18 issue of *Science* titled "Carbon in the Universe," Ames researcher Farid Salama, collaborating with Thomas Henning of the Astrophysikalisches Institut in Jena, Germany, reports finding the unique signatures of an exotic form of carbon in deep space.

Known as PAHs (short for polycyclic aromatic hydrocarbons), these carbon-based molecules, shaped like fragments of chicken wire, are thought to be ubiquitous in space. The existence of PAHs in the interstellar medium (ISM) may explain the mysterious spectral signatures that are common throughout interstellar space.

"Understanding the makeup of the ISM will help us better understand the origin

and evolution of life in the universe," said Salama. "It is a key issue for astrobiology and could demonstrate that life's essential, pre-biotic, carbon-based building blocks are abundant in the ISM."

Without carbon, life as we know it would not exist. The element plays key roles in the evolution of stars, planets and human bodies because carbon is abundant and can form complex structures.

PAH research may also help to solve a problem that scientists have struggled with for most of the century. They have detected more than 100 mysterious interstellar "holes" in the spectra of starlight. Scientists now believe that a form of PAHs might be the unknown matter producing these interstellar holes (or bands in the spectra).

PAHs, thought to be formed in a star's atmosphere, are stable carbon molecules formed at high temperatures. They can

withstand the intense radiation and harsh environment of interstellar space. On Earth, PAHs cause pollution and cancer. PAHs are found in diesel exhaust, burned pots and pans, charred hamburgers and cigarette smoke.

Simulating the conditions of space, Ames scientists measured the spectra of large, carbon-bearing molecules in the ultraviolet and visible light bands and compared the spectra to astronomical data from Kitt Peak and other observatories.

The scientists simulated the space environment using extreme cold, a near-vacuum and artificial starlight.

During the next phases, scientists will continue research using a more sensitive gas-based measuring technique that almost precisely approximates interstellar conditions, Salama said.

The Astrophysikalisches Institut explored the same problem tackled by Ames' scientists by studying larger, grain-sized carbon, another type of carbon material produced by stars.

"I'm a big fan of science collaboration," said Salama. "It helps push the boundaries of science, generates new ideas and speeds the research process."

The paper explored key astrobiology issues such as how the study of cosmic carbon provides clues to the solar system's origins, how life may have been introduced to Earth and the very structure of the universe. Stars create carbon in their interiors and release it into space, making carbon an ideal probe and tracer of the birth and death of stars and planetary systems. Carbon could also help unlock the mysterious processes in deep interstellar space.

By KATHLEEN BURTON

Lunar Prospector gathering data closer to the Moon's surface

On December 19, mission controllers in building 244 at Ames, successfully commanded the Lunar Prospector spacecraft into a 40-kilometer (approximately 25-mile) lunar polar orbit, down from its year-long 100-kilometer (63-mile) mapping orbit, beginning the transition to the spacecraft's extended mission.

The spacecraft will remain in the new 40-kilometer orbit until January 15 when Lunar Prospector will be commanded to an even lower 30-kilometer (approximately 19-mile) orbital path. These actions will officially complete the end of the very successful primary mission that began a year ago in January 1998.

"Lunar Prospector's instruments have gathered such superior data that we have far exceeded our primary mission objectives," said Sylvia Cox, NASA's mission manager for Lunar Prospector. "This success raises our expectations about getting an even closer look at the lunar surface, collecting data at higher

resolutions and gaining further insights about our closest celestial neighbor."

The extended mission is expected to continue through June, during which time the five instruments onboard will gather additional science data at significantly higher resolutions. These data will enable scientists to continue to refine their estimates concerning the concentration and form of hydrogen detected at the north and south lunar poles. Mission scientists interpret hydrogen detected at the poles as deposits of water ice. Mapping of the Moon's magnetic and gravity fields will also benefit greatly from the lower orbit. Additionally, initial global maps of the Moon's elements will be confirmed with the close-up data.

More information about Lunar Prospector, its science data return and related charts and graphics can be found on the project website at: <http://lunar.arc.nasa.gov>



Lunar Prospector

By BETSY CARTER



see related story on page 4

4 Months to Certification

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

Ames Scientists Recognized

Two Ames employees elected Fellows of the AIAA

Dr. Dallas Denery, deputy chief of the aviation systems research, technology and simulation division, Code AF, and Dr. Daniel Reda, senior research scientist in the experimental physics branch, Code AIP, have been elected Fellows of the American Institute of Aeronautics and Astronautics (AIAA).

"AIAA Fellows are persons of distinction who have made notable and valuable contributions to the arts, sciences, or technology of aeronautics or astronautics," noted AIAA President Sam Iacobellis in announcing their selection for this prestigious award. Only one Fellow is elected each year for every one thousand members of the institute.

Denery and Reda, who are a part of 34 Honorary Fellows and Fellows elected for 1999, will be confirmed as AIAA Fellows at the Global Air and Space '99 International Business Forum and Exhibition, May 3-5 at the Hyatt Regency Crystal City Hotel in Arlington, VA. Both men will be honored at the AIAA's annual Fellows Dinner and Reception on May 4 and at the AIAA's Honors Night Banquet on May 5.

Denery and Reda were nominated for the award by Ames Center Director Dr. Henry McDonald. Reda was nominated for his development of the shear-sensitive liquid crystal coating method for measurement of shear stress vector distributions, and for pioneering research on boundary layer transition in supersonic and hypersonic flight. Denery's research was credited with providing daily benefits to the country's air transportation system.

"Dr. Denery's personal research in guidance and control theory, combined with his brilliant technical and managerial leadership of research programs, have yielded critical advances and numerous innovations in

the guidance and operation of aircraft and air traffic control systems," McDonald noted. "Dr. Denery is widely recognized internationally for numerous personal research contributions during his early career to the theory and methodology of systems identification and flight dynamics, which led to significant improvements in the ability to identify and converge on parameter esti-

mates, and the computational estimation of linear systems."

"Dr. Reda is currently recognized nationally and internationally for his pioneering research on the use of liquid crystal coatings for the visualization and measurement of continuous surface shear-stress vector distributions," McDonald noted.

"No such capability existed prior to this work, and the impact of his new, patented methodologies on NASA, industry and university programs is substantial."

During his career, Denery devised a method to retrofit an automated two-segment approach to the current jet transport fleet to provide relief of the national problem of aircraft noise. He also developed and led a program which flight-demonstrated the first fully integrated digital avionics system for general aviation.

In recent years,

Denery developed an agency program in aircraft automation that led to three new programs: automation for air traffic control, automated nap-of-the-earth and differential global positioning systems (GPS). One program, the Center TRACON Automation System (CTAS) has been adopted by the Federal Aviation Administration (FAA) and the airline industry as the cornerstone for future automation in the terminal area and as the major component of near-term capacity enhancements planned in support of free-flight. Denery also developed the technical plan for NASA's Advanced Air Transportation Technologies (AATT) program, a \$400 million program that is one of the agency's most important

initiatives in aeronautics.

"I am very pleased and proud to have been selected as a Fellow of the AIAA," Denery said. "To be included among this group of outstanding individuals is very special. I am thankful to NASA and the people I have worked with for the opportunity to pursue the interesting and relevant research that led to this honor, and I am

looking forward to helping Ames continue this tradition in the future," he added.

During his career, Reda has made notable and valuable contributions toward advancing the state-of-the-art in fluid mechanics, aerothermodynamics and aerodynamic measurement technologies. He is the world's leading authority on the use of

liquid crystal coatings for the visualization and measurement of continuous surface shear stress vector distributions, holding patents on both methodologies.

He is also a nationally and internationally recognized authority in the field of boundary layer transition to turbulence in supersonic and hypersonic flows. Reda is widely published, having authored 73 publications so far, 60 of these as the

lead or sole author. He holds four patents on aerodynamic measurement techniques, two as the sole inventor.

Reda's primary research focus in the 1990s involved the development of a coating and imaging technique for the full-surface visualization and measurement of continuous shear stress vector distributions, a previously non-existent capability. He invented methodologies that allow scientists to more thoroughly and precisely validate CFD (Computational Fluid Dynamics) codes and also enable aerodynamicists to clearly define cause-and-effect relationships between flowfield and/or configurational variations and resultant aerodynamic-performance consequences.

"To have your technical contributions recognized by your peers is the most gratifying aspect of this award," Reda said. "In order to stay in science, I've had to change laboratories and areas of study several times, and I can honestly say that my NASA Ames experience has been the most rewarding and productive tenure of my entire career. A special thank you to Sandy Davis, Paul Kutler and Charles Smith for creating and fostering the required research environment and to Mike Wilder of the MCAT Institute for helping me to validate the liquid crystal methodologies."

AIAA is the world's pre-eminent aerospace information resource and the largest professional society for aeronautics and astronautics professionals.

BY MICHAEL MEWHINNEY



photo by Tom Trower
Dr. Dallas Denery



photo by Roger Brimmer
Dr. Daniel Reda

Center Briefs

NASA technology detects natural marine oil seeps

NASA is partnering with industry to identify natural marine oil seeps in the Gulf of Mexico, offering clues about oil deposits. Through the commercial remote sensing program at NASA's Stennis Space Center, Stennis, MS, NASA is demonstrating practical applications of space technologies in America's marketplace.

Using remote sensors mounted on aircraft and satellites to look at the Earth's surface, scientists gather information for many uses, including roadway planning, disaster assessment, or in this case, to help identify marine oil seeps. They occur naturally as oil migrates through cracks from deposits deep below the ocean floor and then rises to the surface, becoming oil slicks. The seeps offer a clue to the location of underwater oil deposits.

Stardust mission set

Set for launch from Cape Canaveral Air Station, FL, on Feb. 6, Stardust will be the first U.S. mission dedicated solely to a comet, and the first return of extraterrestrial material from outside the orbit of the Moon.

The primary goal of this Discovery program mission is to collect comet dust and related measurements during a planned close encounter with comet Wild 2 (pronounced "Vilt-2") in January 2004.

The Stardust spacecraft will also bring back samples of interstellar dust particles, recently discovered material streaming into the Solar System. Ground-based analysis of these samples after their return in January 2006 should yield important insights into the evolution of the Sun and planets, and possibly into the origin of life.

NASA selects investigations for Japanese Solar-B mission

NASA announced in December selection of three investigations to be flown on Japan's Institute of Space and Astronautical Science (ISAS) Solar-B mission planned for launch in 2004; namely, a 19.7-inch (50-cm) optical telescope with sophisticated focal-plane instrumentation; an X-ray telescope for imaging the high-temperature corona and an extreme-ultraviolet imaging spectrometer for diagnosing events observed.

The Solar-B program will be a multilateral international collaboration including Japan, the United States and the United Kingdom. The objective of Solar-B is to study the origin of the Sun's outer atmosphere; the corona; and the coupling between the fine magnetic structure at the Sun's surface, the photosphere and the dynamic processes occurring in the corona.

Ames receives Outstanding Competition Advocacy Installation award

NASA Headquarters acting associate administrator for procurement, Tom Luedtke, announced recently that Ames has been selected for NASA's "Outstanding Competition Advocacy-Installation" award for the second year in a row. This is a high honor that will be publicized throughout the agency as well as within the professional procurement community.

Ames has one of the most successful competition advocacy programs in the Agency. For fiscal years '95, '96, '97 and the first ten months of '98, Ames competed its obligation amounts at a percentage rate averaging 92.4% and for numbers of actions at a percentage averaging 82.3%. All people involved in the acquisition process, including acquisition division personnel, COTR's and technical managers, can take pride in their contributions to enhancing competition.

In order to maintain its accomplishments, Ames has an active outreach pro-



photo by Roger Brimmer

Charles W. Duff II, Chief, acquisition division, is shown receiving the Headquarters "Certificate of Appreciation" from Dr. Henry McDonald, Center Director.

gram for both industry and internal customers. Also, the acquisition division continually updates tools for market research used by its staff. These effective methods will continue to provide the largest possible number of firms with opportunities to compete for business at Ames.

Diversity training--a collaboration of the EOP and MLC

Interested in diversity issues at Ames? Want to learn more about partnership collaboration? The Equal Opportunity Programs office and the Ames Multicultural Leadership Council invite you to attend a workshop entitled "Collaboration for the New Millennium" on Wednesday, January 20 from 8:30 a.m. to 5:00 p.m. in the Ballroom of the Moffett training and conference center (Building 3).

One goal of the workshop is to develop a plan for collaboration between groups actively dealing with diversity issues at Ames. The groups include advisory groups, the Equal Opportunity Programs office and the EO Board. Another goal is to develop a "next step" to increase awareness of diversity issues at Ames.

All interested members of the Ames community are welcome, but space

is limited to the first 60 people. Please contact Marilyn Jackson at email: mjackson@mail.arc.nasa.gov to reserve a place.



Is Ames ready for ISO 9001 certification? --another perspective might help

Mel Brooks movie fans will recall Igor greeting young Dr. Frankenstein at the train station with "walk this way." To pass our ISO 9001 certification audit in April, it might help to "think this way" -- like an auditor! To auditors, just remember that they are all from Missouri--the Show Me State.

Ames personnel are already working on the center's audit preparation checklist--a carefully selected sample from the 160 "shalls" in the ISO 9001 international standard. Thinking like auditors will help us get the most benefit from that audit preparation checklist. More importantly, thinking like auditors will help us understand our own quality system.

The most fundamental thing on an auditor's mind is "objective evidence." ISO auditors all have the same coffee mug with Say It!, Do It!, Prove It! in big red letters. Auditors need to see tangible evidence that the quality system is more than just warm words on paper. Auditors collect objective evidence by analyzing documented procedures, observing practices, interviewing personnel at every level and reviewing data and records. Objective evidence is what allows an auditor to verify our conformance to each one of those 160 requirements in the ISO standard. An inability to show evidence that our quality system is both implemented and effective will result in a finding of nonconformance.

Most auditors have technical degrees and take a very systematic approach that Ames engineers and scientists may find familiar. Each of us can duplicate an auditor's approach. First, look at the Ames web site at <http://dqa.arc.nasa.gov/iso9000> to find the latest revision of each center, directorate, division and branch procedure that applies to your position. If you are unsure which procedures apply, discuss them with your supervisor.

Next, an auditor would highlight the word "shall" every time it appears in a procedure. This might produce a number of requirements like, "The project engineer shall define test requirements for each configuration." Or, "Each researcher shall initial and date their entries in the lab log book." An auditor will look for tangible evidence that each of these requirements has been implemented.

At this point, you can duplicate the third step an auditor would take by asking, "Can I show an example of how I have implemented this requirement?" The researcher involved with that procedure might ask, "Is the lab log book readily available, and do my entries have initials and dates?" Or if you are that project engineer, "Are my test methods documented and easily retrieved, and do they clearly identify the test requirements for every configuration?"

If asked by an auditor, will you be able to show an example and describe how you implement each of the applicable "shalls" that you highlighted?

This three-step approach might be called procedure-based auditing. It is one way auditors verify that procedures comply with the standard, and that we comply with our own procedures. This model is also good for individuals who want to better understand our quality system and get ready for the ISO certification audit by thinking like an auditor.

Another common approach that auditors use is more process oriented. They "walk" through a process from start to finish to see how we address the common sense operating practices that have been captured as requirements in the ISO 9001 standard. This is one way auditors can go beyond just auditing for compliance, and assess whether our processes will effectively produce quality products and services. Managers and supervisors that have overall responsibility for individual processes may find this end-to-end process approach the best way to think like an auditor.

One way to do this is MBWA - Management By Walking Around. Start at the start. Walk through the process in the same way that work flows. Talk to personnel who take in new work. Are the requirements for new work documented and unambiguous? How well documented are changes to those requirements? How are these requirements reviewed and accepted? Once the requirements are clear, does the work just commence or is it planned first? Is the work broken down into tasks and communicated to work groups in a logical and documented manner?

Once requirements are communicated, are the methods used to produce the prod-

uct or service logical and appropriate? Are requirements for purchased goods sufficiently specific to ensure that you'll get what you need in order to meet final product requirements? Should the supplier be pre-qualified? What quality controls should the supplier implement? How will you verify that purchases fully meet your own requirements?

When producing the product, would it be easy to use the wrong procedure, tool, measuring device, software or specification? How is the right processing sequence and method communicated? If the process doesn't operate as intended, will appropriate metrics warn you--before customer complaints are received? How easily can errors be made that might go undetected? Is it important that personnel demonstrate proficiency at a pre-determined level before being assigned?

Is it reasonable to wait until the product is complete before verifying conformance to requirements, or are there logical intermediate verification points? Are all specified product requirements being verified? Are verification methods logical and documented--when, who, how, acceptance criteria? Is product integrity protected throughout all processing, verification and delivery? How are these product protection requirements defined?

When complete, do your products and services rank with the best in the world--how do you know? Do your customers agree that their requirements have been met?

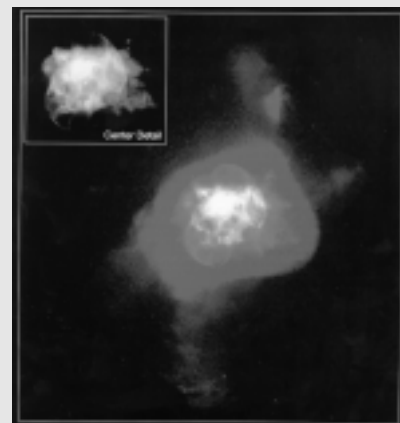
Ultimately, for Ames to achieve certification, auditors must assess whether our quality system effectively implements the Ames quality policy. We can maximize our success by thinking in the same way.

BY BARRY GRIMM 

Turtle nebula under observation

Planetary Nebula NGC 6210, (the "Turtle" nebula), taken with the Hubble Space Telescope in August 1997. Shrouds of gas comprise the nebula; material is flung off by a dying, sunlike star, and streams out in opposite directions. Ames scientists and collaborators from other institutions are concentrating on this object, currently studying its spectra using the Infrared Space Observatory (ISO) to determine the star's temperature, density and chemical composition. The analysis of the biogenic elements present--hydrogen, carbon, nitrogen and oxygen--has important implications for astrobiology (the study of the origin and evolution of life in the universe).

*NGC 6210 is about 6,600 light years from Earth in the constellation Hercules. The nebula measures 1.6 light years from the top of the turtle shape to the tip of the bottom. This image is available at: <http://oposite.stsci.edu/pubinfo/1998/36>
Photo Credits: R. Rubin and C. Ortiz, Ames Research Center; P. Harrington and N. Lame, Univ. of Maryland, R. Dufour, Rice Univ.*



Ames' researchers support Mars robotic exploration

NASA Ames researchers are playing a key role in supporting two Mars robotic exploration missions.

The Mars Polar Lander, which launched on January 3, has two Mars microprobes with advanced thermal protection systems designed, tested and manufactured at Ames. (The Mars Microprobe mission is also called Deep Space-2, the second New Millennium deep space technology-validation mission, which is managed by the Jet Propulsion Laboratory, Pasadena, CA.)

The Mars Polar Lander is part of NASA's long-term program to explore Mars using robots. The lander will touch down on a frigid, barren steppe near the edge of Mars' south polar cap and dig for traces of water ice beneath the surface.

Equipped with a robotic arm, the lander will also carry two tiny microprobes with penetrators that will smash into the surface and test new space exploration technologies.

According to Huy Tran (Code ASM) who heads Ames' thermal protection team, the Ames-developed heat shields will protect the two probes from the very high temperatures (approaching 3200 degrees F) expected during the Mars entry with minimal recession. The probes will impact the Martian surface with a terminal velocity of 200 millimeters per second. As the probes smash into the Martian surface, the heat shields will shatter and allow a clean penetration into the rust-colored Martian soil. The two probes will collect samples and do spectral analyses for water signatures.

To meet the reentry technology challenge, the Ames team developed a new heat-resistant material that can withstand high temperatures and is also thin and light.

The new material is about 1/5th the thickness of the space shuttle heat shield. The new material is called SIRCA/SPLIT (short for "Silicone Impregnated Reusable Ceramic Ablator/Secondary Polymer Layer Infiltrated Tile.")

The heat-shield technology was developed at Ames about 1-1/2 years ago.

"The entire Ames TPS team, including project manager Dan Rasky, and the technical staff of Christine Johnson, Ming-Ta Hsu, Timothy Chen, Harry Dill and Bill Vujevich, worked very hard; we took it all the way -- from concept to flight," said Tran.

The entire heat shield weighs only 368 grams, compared to older technology heat shields that typically weigh triple that amount. Future uses of the Ames-developed material might include space commercialization, Tran said.

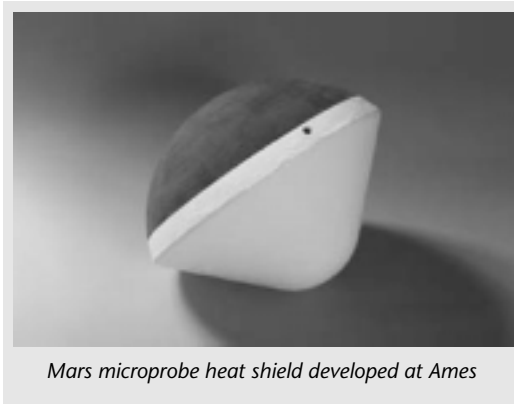
The Mars Microprobes will touch down on the red planet in December 1999.

"We won't know if the heat shield is successful until a signal (from the probe) comes back," said Tran.

Past work by the Ames team includes developing heat shields for the Stardust and Mars Pathfinder missions.

A science team from Ames (comprised

of Drs. David Catling, Aaron Zent, Julio Magalhaes and Jeff Moersch) also will play an important role in the mission. They will analyze the data from four water detection,



Mars microprobe heat shield developed at Ames

soil analysis and atmospheric structure analysis experiments aboard the probes. In addition, Dr. Zent is also a team member for a thermal evolved gas experiment on board the Mars Lander.

Ames researchers are also supporting the Mars Climate Orbiter mission, which launched on December 10, 1998. The Orbiter will achieve a stable orbit around Mars, and then use atmospheric instruments and cameras to provide detailed information about the surface and climate of the Red Planet. Dr. Robert Haberle is co-investigator for an experiment that will characterize Mars' atmosphere.

BY KATHLEEN BURTON

Helicopter lands in East Palo Alto school yard

A group of young East Palo Alto students got the chance to climb aboard a U.S. Army helicopter on Monday, Dec. 14, when one

based at Ames landed in their school yard.

The helicopter landed at 10 a.m. at the school yard of the Edison McNair Academy, 2033 Pulgas Ave, East Palo Alto. The helicopter was flown by Lt. Col. Chris Sullivan and NASA pilot Munro Dearing and carried crew chiefs Ron Gardner and Fernando Matulac. In addition, several engineers and scientists from the Army/NASA Rotorcraft Division gave presentations about helicopters and other related topics to the school's seventh and eighth grade students.

Nicknamed the Kiowa, the OH-58C light observation helicopter is powered by a gas turbine T-63-A-720 engine and can travel

at 139 mph. The helicopter's rotor is 35 feet 4 inches in diameter, and the aircraft has a maximum takeoff weight of more than 3,000 pounds.

The visit was sponsored by the American Helicopter Society's San Francisco Bay Area Chapter Community Outreach Program.

For more information, contact Community Resource Director Davina Katz at the Edison McNair Academy, (650) 329-2888, ext. 135, or Megan McCluer at Ames at ext. 4-0010.

BY MICHAEL MEWHINNEY



NASA pilot Munro Dearing (left) shows Miguel Mendoza, 13, an eighth grader at Edison McNair School in East Palo Alto, the controls in the OH-58C light observation helicopter.

photo by Roger Brimmer

Center Activities

Celebration--Black History Month

As Ames prepares to celebrate Black History Month, it is important to remember that a full appreciation of the celebration requires an understanding of the social and academic climate that prevailed in the Western world, particularly in North America, before 1926 when Black History Month was established.

It is important to recall that between 1619 and 1926, African Americans and other peoples of African descent were classified as a race that had not made any contribution to human civilization.

Within the public and private sector, African Americans and other peoples of African descent were relegated to the position of non-citizens and often defined as fractions of humans. In fact, African Americans were so dehumanized and their history so distorted in academia that "slavery, peonage, segregation and lynching" were

considered justifiable conditions.

It was this kind of climate and the sensational, racist scholarship that inspired the talented and brilliant African American scholar Dr. Carter Godwin Woodson to lead the struggle and search for the truth and institutionalize what was referred to as "Negro History Week."

Under Woodson's direction and contributions from other African American and white scholars, the "Negro History Week" was launched as a serious platform in 1926 to neutralize the apparent ignorance and deliberate distortion of black history.

Meetings, exhibitions, lectures and symposia were organized to climax the scientific study of the African experience throughout the year in order to give a more objective and scholarly balance in American and World History.

Today, this national and international observance has been expanded annually to encompass the entire month of February. For those wishing to learn more about African history, it is suggested that you read works by distinguished African historians, such as: Cheikh Anta Diop, Chancellor Williams, Walter Rodney, Adu Boahen, John Jackson, Yosef Ben-Jochannan, John Hope Franklin, Leronne Bennett Jr., John Henrik Clarke, J. F. Ade Ajayi and many more.

BY MARY BUFORD HOWARD

Correction to Fall 1998 Ames Telephone Directory--the correct phone number for the Locksmith is ext. 4-3843 and the mail stop is 76-1.

Mediator training program at Ames

Recently, mediators and trainers at Ames participated in an Alternative Dispute Resolution (ADR) class. The purpose of ADR is to provide a productive environment and process for resolving differences in a direct and simple manner.

Further information about ADR and training opportunities in this area can be obtained from Debbie Wilson of the Equal Opportunity Programs Office, at ext. 4-6507.



photo by Roger Brimmer

From left to right: Jim Lambright, Defense Equal Opportunity Management Institute (DEOMI); Lupe Velasquez, acquisition branch for information systems; Ruben Ramos, space projects division; and Thomas Edel, protective services office.

NASA Minority Contractor of the Year -- Symtech Corporation



photo by Roger Brimmer

From the center and counterclockwise: Dr. Henry McDonald, Center Director; Seymour Metters, III, President of Symtech Corporation; Marion Legg; Connie Cunningham, Deputy Chief, acquisition division; Steve Howard; Roy Austin; Rob Christensen; Sarah West; Peter Mariani; Ken Moller; Yvonne Chen; Dawn McIntosh and Kang Chen, site manager.

Other Symtech employees at Ames who were not present at the photo session include Robert Hogan, Neil Heather and Eric Vacin.

Symtech Corporation was presented with the 1998 NASA Minority Contractor of the Year award on Sept. 23 of last year at NASA Headquarters. The purpose of the award is to nationally recognize successful minority contractors who have made outstanding contributions to NASA's mission in the technical arena. The award cer-

emony is the highlight activity of the annual Minority Enterprises Development (MED) week. Symtech Corporation, Alexandria, VA, is an 8(a) firm that provides scientific and technical services in support of the Earth Sciences and Space Science Divisions in the Ames Space Directorate.

Events & Classifieds

Calendar

Jetstream Toastmasters, Mondays, 12 noon to 1 p.m., N-269/Rm. 179. Guests welcome. POC: Jenny Kahn at ext. 4-6987 or Karen Matsuoka at ext. 4-6184.

Model HO/HON3 Railroad Train Club at Moffett Field invites train buffs to visit and join the club in Bldg. 126, across from the south end of Hanger One. The club is in particular need of low voltage electricians and scenery builders & maintainers. 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 at (408) 735-4954 (work) or (408) 281-2899 (home).

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

Ames Ballroom Dance Club, Beginning and Intermediate East Coast Swing, Tuesdays from 5:15 p.m. to 6:30 p.m. Moffett Training and Conference Center, Bldg. 3 in the Showroom. POC: Deb Narasaki at email: dnanarasaki@mail.arc.nasa.gov. New ABDC website: <http://arcapps.nasa.gov/Info/BallroomDance/Welcome.Htm>

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

Ames Multicultural Leadership Council Workshop, Jan 20, 8:30 a.m. to 5:00 p.m., all day training on diversity issues and building consensus. Moffett Training and Conference Center. POC: David Morse at ext. 4-4724 or Sheila Johnson at ext. 4-5054.

NFFE Local 997 Union General Meeting, Jan 20, 11:30 a.m. to 12:30 p.m., Bldg. 19/Rm. 2017. Guests welcome. POC: Marianne Mosher at ext. 4-4055.

Ames Asian American Pacific Islander Advisory Group Meeting, Jan 21, 11:30 a.m. to 1 p.m., N-241/Rm. B2. POC: Daryl Wong at ext. 4-6889 or Brett Vu at ext. 4-0911.

Native American Advisory Committee Meeting, Jan 26, 12 noon to 1 p.m., Ames Café. POC: Mike Liu at ext. 4-1132.

Ames Contractor Council Meeting, Feb 3, 11 a.m., N-200/Comm. Rm. POC: Greg Marshall at ext. 4-4673.

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

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

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

Nat'l Association of Retired Federal Employees, S.J. Chapter #50, Meeting, Feb 5, at the Elk's Club, 44 W. Alma Avenue, San Jose. Social hour: 10:30 a.m. Prog. & bus. mtg. follow lunch at 11:30 a.m. POCs: Mr. Rod Peery, Pres., (650) 967-9418 or NARFE 1-800-627-3394.

Southbay FEW Chapter Meeting, Feb 9, 11:30 a.m. to 12:30 p.m., Bldg. 241, Rm B2. POC: Christine Munroe at ext. 4-4695.

Java Users Group, Feb. 10, 1:30 p.m. to 2:30 p.m., Bldg. 258, Rm. 127. POC: Sharon Marcacci, ext. 4-1059; <http://jug.arc.nasa.gov>

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

Ames Sailing Club Meeting, Feb 11, 11:30 a.m. to 1 p.m., N-262/Rm. 100. POC: Greg Sherwood, ext 4-0429. Web site: <http://sail.arc.nasa.gov>

Ames Amateur Radio Club, Feb 18, 12 noon, N-260/Conf. Rm. POC: Mike Herrick, K6EAA at ext. 4-5477.

Ames Classifieds

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

Housing

Room for rent - avail now. Furnished room w/phn. Open space w/creek on east, large lawn on west, park on north, wilderness on south, walking distance from Castro Street. Share ba/kitchen/garden/laundry. Easy transport: bus/train/El Camino/H101/237/85/Cent Expy. \$560/mo. Call (650) 969-3932 or email at: solemate@best.com

Temporary space available or for part time use. Ideal for Interns. Bed + closet in a home in rustic & natural area near Castro Street in Mountain View. Weekly: \$100 (+ one month dep.) Call (650) 969-3932 Lv msg., or email at: solemate@best.com

Wanted: Shared housing for grad student/Ames intern from 2/20 - 5/16/99 near pub. trans. \$545 limit. Email: Grisward@isu.isunet.edu for more info.

For rent: Mountain View/Sunnyvale home, 3bd/1 ba, avail. now, \$1,795 mo. Nina (650) 843-5568.

MV twnhse for lease. 2bd/2.5 ba., 1250 sq.ft., yard, very close to Ames. \$1,445/mo + dep. Avail Feb. 1. Call (650) 964-1900.

Santa Clara 2-story townhouse, 2bd/1.5ba, spa/pool, patio, carport, completely remodeled. \$1,400. Call (408) 248-1516.

Respons. adult(s), max of 3 to share large 4bd/2.5ba Milpitas home. Choices: master bd/priv bath for sgl (\$725) or couple (\$1,000) + part of utils or two other rooms avail from a choice of 3 (\$650, \$600, \$500) + 1/3 utils. Amenities: cable, W/D, fireplace, pool & spa. 20 min from Ames. Access to H680/237/880. N/S. No alcohol/pets/kids. First/last/\$400 dep. Avail Feb. Carina (408) 262-5269. Lv msg.

Part-time or full-time roommate needed to share expenses. 2bd/1ba apartment in S'vale off Mary Ave. near El Camino. Rent negotiable for part-time rentee. Available 1/1/99. Barrie/Anne (408) 736-8961.

House for rent in center of Cupertino, 4bd/2ba, swimming pool, washer/dryer, easy access to Lawrence Expressway, H280, 85, \$2,000/mo. plus deposit. Available now. James (408) 741-4922.

Visiting scientist from Europe needs to rent a small studio apartment from 4/26-6/18 near Ames. Contact Hanwant B. Singh at ext. 4-6769 or Robert Chatfield at ext. 4-5490 for additional information.

Transportation

'76 Ford Granada 4-door, 62K orig mls, V-8, AT, normal equipment, interior in good shape, everything works, starts/runs strong, needs valve job on #7 cylinder to run perfect. \$500 or B/O. Call (408) 395-6477.

'81 Ford F100 pickup. 6cyl, 4 speed manual, Ranger XLT pkg, camper shell, dual tank. 78K mls. Have papers. Good condition. \$3,500. Jon (408) 732-8833 after 6 p.m.

'82 GS550MZ motorcycle (Classic-First Katana), runs great, new tires, low mls, \$650. Call (408) 734-9838.

'84 Honda Accord sedan, 5 spd, orig. owner, 140K mls, runs great, minor body damage, \$1,600. Call (408) 225-7864.

'86 Nissan 300ZX coupe 2door, silver, 5 speed, T-bar roof. Taken care of. Have papers (Nissan dealer and Scotts Performance). Orig owner. 130K mls. \$4,000. Jon (408) 732-8833 after 6 p.m.

'86 Lance 20 foot 5th wheel, great for camping and complete home on wheels w/two queen beds, nice kitchen w/frig, bath w/shower, space and water heaters. Everything works well. \$3,500. Call (415) 902-5791.

'87 Park Ave, all maint. receipts, new paint, 166K mls, loaded, mint cond. \$2,850 or B/O. Call (510) 471-2570.

'88 Mercury Sable GS, p/windows, locks and mirrors, cruise control, AM/FM/cassette, A/C, 100,800 mls. \$3,200 or B/O. Richard or Charly (650) 573-5188.

'92 Ford Aerostar XL, extended body, A/C, Great family van. \$6,200. Call (510) 581-9820 or email angelabw@jps.net.

'92 Lincoln Town car 4-door Executive Series, 120K mls, 4.6L V-8, AT, power everything, security system, tow package, interior good, new air springs, great ride, only 85K mls on engine. \$8,800 or B/O. Call (408) 395-6477.

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

'95 Chrysler LeBaron convertible, amethyst w/white top, V6, auto, AC, power everything. AM/FM Stereo, CD player. 54K mls, runs great, exc cond, \$8,000. Rose (510) 659-6338

'95 Chevy Blazer 4.3 Vortec eng., fully loaded, 4x4, leather int., 70K mls, \$17,500 or B/O. Bob (408) 736-4039.

Vacation rental

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

Miscellaneous

Childcare: Sign up for waiting list at the Menlo Survey Daycare Ctr, aka GeoKids, a parent cooperative accredited childcare center located in Menlo Park. NAEYC federal. For more info visit GeoKids' website: <http://geokids.wr.usgs.gov>, or call (650) 329-4236.

Bed frame (queen head, foot, and side rails), can be four poster or canopy, Ethan Allen (Georgian Line)/Queen Anne, dark solid wood and very nice, \$350. Call (650) 941-2784.

Washer and drier in good working condition. \$10 each. Call (650) 813-0563.

Sofa-sleeper, queen size, dark blue, exc. cond, \$120. Call (408) 446-4896

Coffee table books-(2) Norman Rockwell-Little Orphan Annie, unused. \$15 ea. Five Time-Life cookbooks. Unused. \$25 all. Call (650) 968-8650.

Audio System, 480 watt Kenwood receiver, SCD changer and equalizer. 3-way speakers (2) w/ 12" woofers + 60 watt powered subwoofer. \$700. Mike (408) 257-3175.

Two dressers (one tall, one long) and full length standing mirror matching set. Light colored wood, new handles. Perfect for a girl's bedroom. \$400 we deliver or \$350 you pick up. Call (650) 938-8657.

Tri-color (Blk, wht, tan), red and white cocker spaniel puppies for sale. Show quality AKC, OFA, championship bloodline, exc. health history, \$450. Call (408) 729-1443.

Rowing machine, converts for squats, bench press, curls, situps, more. Folds for storage, instruction, \$25. New spare pneumatic donut tire from Toyota Tercel. \$10. Like-new radial tire Yokohama 195/60R15. Less than 5K miles. \$10. Call (510) 471-9384.

Wanted: Patches, stickers with old Ames logo design. Gloria (707) 995-3431. Lv msg.

Currier spinet piano, small upright in dark walnut, exc. cond., price negotiable. Christina (408) 295-3651.

DVD movie of "Goodfellas", \$15. Call (408) 295-2160.

Peppermint patty candy dispensing machines. \$100 each. Call (831) 338-3264. Lv msg.

28.8 PC fax/modem, w/manuals & software. \$15. Tape backup drive & software w/manual for Windows + (5) backup tapes. \$25. Call (408) 295-2160.

AT&T Pebble Beach Nat'l Pro-Am February 1-7. Two tickets for all days at all three courses. Total \$180. Ralph (408) 730-4630.

Ames transfers control of X-36 to Dryden

On December 9, Ames transferred control of the NASA/Boeing X-36 Tailless Fighter Agility Research Aircraft to NASA Dryden Flight Research Center, Edwards, CA, for future flight tests.

NASA completed its X-36 flight research program last November, successfully demonstrating the feasibility of future tailless fighters to achieve agility levels superior to today's best military fighter aircraft. The Air Force Research Laboratory at Wright Patterson Air Force Base, Dayton OH, was scheduled to begin its Reconfigurable Control for Tailless Fighter Aircraft (RESTORE) flight tests on the X-36 at Dryden on Dec. 12.

The RESTORE program will use advanced flight control software to respond to a variety of battle damage and hardware failures. The program will provide demonstrated technology that increases aircraft survivability and significantly reduces life cycle costs of military and commercial aircraft. The RESTORE flight tests are a joint effort funded by the Air Force Research Laboratory, Dayton, OH; NASA Dryden Flight Research Center, Edwards, CA; and the Naval Air Systems Command (NAVAIR), Patuxent River, MD.

The Boeing Company owns the X-36 aircraft, and the company's Phantom Works division is developing the RESTORE technology. During the RESTORE program, the Air Force will fly the remotely piloted X-36 aircraft using neural network software to provide flight control reconfiguration during simulated damage in flight.

During the original X-36 flight research program at Dryden, 31 flights were made in only 25 weeks. The first flight occurred on May 17, 1997; the final flight took place on Nov. 12, 1997 and lasted 34 minutes. The X-36 flew a total of 15 hours and 38 minutes and used four different versions of

high and weighs 1,270 pounds. It is powered by a Williams International Corp., Inc., Walled Lake, MI, F112 turbofan engine that provides 700 pounds of thrust. The aircraft is remotely controlled by a pilot in a ground-station cockpit, complete with a head-up display.

Ames and The Boeing Company Phantom Works developed the technologies required for a tailless fighter beginning in 1989. In 1993, the Phantom Works proposed the remotely piloted aircraft technology demonstration to validate the technologies in a real-flight environment. In 1994, Phantom Works began fabrication of the two aircraft in its rapid prototyping facility in St. Louis. The aircraft was designed and built in only 28 months. NASA and Boeing were full partners in the \$21 million program that was jointly funded under a roughly 50/50 cost-sharing arrangement. During NASA's X-36 flight tests, Ames led the program; Boeing conducted the flight test operation; and Dryden provided range and technical support.



From right to left: Ames Center Director Dr. Henry McDonald and Kevin Petersen (Acting) Director, Dryden Flight Research Center, signed an agreement last month to transfer control of the NASA/Boeing X-36 Tailless Fighter Agility Research Aircraft to NASA Dryden Flight Research Center for future flight tests.

flight control software. The aircraft reached an altitude of 20,200 feet and a maximum angle of attack of 40 degrees.

The 28-percent-scale X-36, built by the Boeing Company Phantom Works in St. Louis, MO, is designed to fly without the traditional tail surfaces common on most aircraft. The X-36 is 18 feet long with a 10-foot wingspan; the airplane is three feet

BY MICHAEL MEWHINNEY

THE AMES **Astrogram**

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