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# SPACE CENTER Roundup

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## JSC expands WSTF Science Advisor program

### *Center partners with CCISD for educational project*



**J**SC is expanding an educational outreach program and is looking for volunteers to work with local schools beginning this fall. The Science Advisor Program, (SciAd), will launch its pilot effort next month in Houston, working with 20 schools in the Clear Creek ISD, including all 18 elementary level schools and two intermediate schools.

The SciAd program is unique because it provides long-term technical advisors to teachers in the schools. SciAds will work with their designated school for up to eight hours a month, for the entire school year, providing the teachers and schools with a consistent, dedicated advisor from JSC.

“One of NASA’s priorities is contributing to education excellence in our country. The SciAd program is a great

way to provide support to our local teachers and schools,” said Nancy Robertson, Chief of the Education and Community Support Branch in the Public Affairs Office.

“With SciAd, the students and teachers know that you are going to come back,” said Michelle Rucker, of the Crew & Thermal Systems Division and a member of the SciAd Steering Committee. “It’s not like other one-time appearances such as Career Day – this is an ongoing, long-term relationship.”

Organizers are currently recruiting at least 40 civil servant SciAds for the 1999-2000 school year. Each SciAd will be allowed eight hours of duty time per month to support their school.

Individuals interested may apply online by visiting the SciAd Web site at [hro.jsc.nasa.gov/SCIAD](http://hro.jsc.nasa.gov/SCIAD). While applications will be accepted continuously, selections for the first phase of the program will be made from applications submitted by September 17.

In addition to volunteers who will work with the teachers, there are also opportuni-

ties for people to serve on the Resource Team. This team will help develop the various projects and tools the SciAds will share with CCISD teachers. SciAd reservists – employees who are interested in helping but aren’t able to commit to becoming a regular SciAd are also needed.

“There are opportunities for all levels of involvement,” said Susan Braymer, SciAd Steering Committee chair and deputy director of Human Resources.

SciAd was originally started in New Mexico by the U.S. Department of Energy and Sandia National Laboratories during the 1990-91 school year. NASA’s White Sands Test Facility soon joined the program which has expanded to four New Mexico school districts and nearly 100 SciAds.

Rucker, who recently transferred to JSC from WSTF, was a SciAd in the Las Cruces School District.

“That was the best part of my job,” said Rucker. “I always came back to work with an adrenaline rush.”

“I once had a group of fifth-grade boys approach me in the school hall and ask, if

they canceled their soccer practice, would I come to their science class. If fifth-grade boys are willing to trade sports for science, SciAd works,” said Rucker.

“So many NASA employees are driven by their love and appreciation for science – by coming into our schools they are able to share with teachers and students their enthusiasm for and expertise in science,” said Terry Brandhorst, Clear Creek ISD Coordinator for Science K-12. Brandhorst recently joined the SciAd Steering Committee, which has been responsible for bringing the SciAd program to life at JSC.

Ultimately, JSC hopes the SciAd program will expand to include other school districts and SciAds from organizations outside of NASA.

“The SciAd program has tremendous potential to benefit everyone involved,” said Braymer. “Our JSC SciAd participants gain the satisfaction of helping teachers educate young people while encouraging and influencing the next generation – who may some day play a part in JSC’s future.” ■



JSC Photo 99E10424 by James Blair

Science Advisor (SciAd) organizers are from left, front: Karen Jackson, Michelle Rucker, Susan Braymer, and Bonnie Dunbar; left back: Mike Kincaid, Nancy Robertson, Rick Barton, Vanessa Bowen, Mike Stewart, Scott Wood, Susan White, Mae Mangieri, Phil West and Jennifer Sheppard.



JSC recognized for pollution prevention.

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NASA attends national La Raza conference.

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Get to know one of JSC's familiar faces.

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# JSC recognized for pollution prevention efforts

The JSC Center Operations Directorate's Environmental Office was honored in Austin May 3 with Vice President Al Gore's Hammer Award for its participation as a charter member of the Texas Pollution Prevention Partnership's (TxP3) collective efforts to reduce pollution in Texas.

"The environmental staff at JSC of David Hickens, Sandy Parker, and Melanie Jo Kines has done an outstanding job of partnering with all the members of the Texas Natural Resources Conservation Commission to find improved methods to achieve environmental compliance and have greatly reduced the pollutants we have at this center," said Center Operations Director Bill Parsons. "I am extremely proud of their efforts."

The TxP3 is a collaborative state-federal environmental effort by the TNRCC, Department of Defense components (U.S. Air Force, U.S. Navy, and U.S. Army), Defense Logistics Agency, NASA JSC, U.S. Coast Guard, and the Texas National Guard. The TxP3 mission is to promote pollution prevention as the standard way of doing business for state and federal facilities. This voluntary pollution prevention approach has resulted in more than \$2.7 million in savings to the state and federal government and has achieved significant reductions in pollution to our air, water, and land resources.

On hand to honor the recipients were: John Kamensky, National Partnership for Reinventing America; Robert Huston, TNRCC chairman; Jeff Saitas, TNRCC executive director; Olga Dominquez, NASA Headquarters environmental management director; Parsons; and senior officials from the Air Force, Navy, Army, Coast Guard and the Texas National Guard. ■



Photo by Wayne Baker, TNRCC

The JSC Center Operations Directorate's Environmental Office receives Vice President Gore's "Hammer" Award, the top honor bestowed by the National Partnership for Reinventing Government. Shown here is David Hickens, (fourth from right) JSC Environmental Office lead receiving the "Hammer" Award at a May 3 ceremony in Austin. Hickens is joined by (left to right) Ralph Marquez, TNRCC commissioner; William Parsons, JSC Center Operations director; Olga Dominquez, NASA HQ Environmental Management director; Gary M. Erickson, U.S. Air Force Center for Environmental Excellence director; Robert J. Huston, TNRCC chairman; John Kamensky, National Partnership for Reinventing Government deputy director, and John M. Baker, TNRCC commissioner.

## Fédération Aéronautique Internationale announces awards

By Nicole Cloutier



The Fédération Aéronautique Internationale, the world's air sports federation, recently announced John Glenn, Andy Thomas and the STS-88, STS-91 and STS-95 crews as recipients of the organization's 1998 awards.

Specifically, the FAI awarded Glenn as recipient of the Gold Space Medal for his significant contributions to the furthering of astronautics and commitment to the cause of space.

Thomas received the Yuri A. Gagarin Gold Medal for his contributions on Mir and for continuing the human presence in

space for the United States space program.

The Vladimir Komarov Diploma, named after Soviet Cosmonaut Komarov, was awarded to the STS-91 and STS-95 crews for their outstanding achievements in the field of space exploration. STS-91 crewmembers including Commander Charles Precourt, Pilot Dominic Gorie, and Mission Specialists Wendy Lawrence, Janet Kavandi, Ph.D., Cosmonaut Valery Ryumin and Thomas were recognized for their monumental mission that concluded the Shuttle-Mir Program by a final docking with Mir.

The STS-95 crew, including Commander Curtis Brown, Pilot Steven Lindsey, Mission Specialists Stephen Robinson,

Ph.D., Scott Parazynski, M.D., Pedro Duque (ESA), and Payload Specialists Chiaki Mukai, M.D., Ph.D. (NASDA), and Glenn, received the diploma in recognition of their mission during which they executed more than 80 science experiments, deployed and retrieved the Spartan Satellite and tested the Hubble Space Telescope Orbital Systems Test Platform.

The Korolev Diploma was awarded to the crew of STS-88, including Commander Robert Cabana, Pilot Frederick Sturckow, and Mission Specialists Jerry Ross, Nancy Currie, James Newman, Ph.D., and Cosmonaut

Sergei Krikalev, for the successful completion of the first International Space Station assembly flight.

The FAI also announced that as the result of STS-91's successful docking with MIR, NASA and Russia now hold the world record for the most assembled mass of spaceships linked in flight. A

De La Vaulx Medal was awarded to commemorate the record, which now stands with a total mass of 548,231 lbs. FAI is the primary

organization responsible for certification of world aeronautical and astronomical records. ■



## Call for abstracts for NanoSpace 2000

NASA is proud to announce the third conference and workgroup combination aimed at organizing micro/nanotechnologies for space applications. Earlier conferences have been successful in encouraging interactions between micro/nanoscale technologists and those responsible for implementation of space systems. The conference's proximity to JSC allows for maximum exposure to engineers and scientists with an interest in these revolutionary technologies.

The focus of this conference is to foster interaction between those working on advanced space systems and mission designs and those who are involved with

revolutionary micro- and nanotechnologies. Out of this conference it is expected that nanoscale scientists will have a better understanding of the needs of aerospace partners, while mission planners will learn what micro/nanotechnologies may be available for their exploration goals.

As with previous conferences, NanoSpace 2000 will focus on space applications of nanoelectronics, nanoscale materials, and microelectromechanical systems. Due to the vital interest to the NASA community, a new area of focus this year will be applications for space biomedical research on the nanoscale. Also, added emphasis will be placed on

energy storage strategies based on micro/nanotechnologies.

Improvements from this work are expected to bring about smaller, lightweight, reliable, and affordable space systems for future exploration missions.

After one day of presentations of technology needs, two days of micro- and nanotechnology development will follow. This leads to the final two days of the conference, consisting of smaller workgroups to break down the issues into possible areas of new technology needs. These workgroup sessions have been especially successful in previous years in helping to determine the direction of future research. ■

Abstracts on relevant micro/nanotechnologies for space applications should be no more than 500 words, text only. Deadline for receipt of abstracts is November 1, 1999. Digital files of the abstract [preferred format is MS Word] should be sent to Thomas D. Nicodemus at [nicodemus@uh.edu](mailto:nicodemus@uh.edu) or [nicodemus@systems.org](mailto:nicodemus@systems.org). Applications may also be mailed to: Center for NanoSpace Technologies, Attention: Tom Nicodemus, P.O. Box 890025, Houston, TX 77289-0025.



**C O M M U N I T Y N E W S****NASA premiers at National Council of La Raza Conference**

A team of NASA astronauts shared space flight experiences with thousands of attendees at the 1999 National Council of La Raza Conference. La Raza is the nation's largest Hispanic civil rights organization. The conference took place July 24 -28 at the George R. Brown Convention Center in Houston.

Veteran Astronaut Ellen Ochoa spoke to attendees about the influence of Hispanics in the space program at the National Affiliate Breakfast on July 25. Ochoa played a key role in this spring's STS-96 mission to the International Space Station. At the breakfast, she recognized La Raza, related the drama of the first mission to the space station and emphasized the importance of math and science for youth who aspire to space exploration.

As part of NASA's participation in La Raza's conference, astronauts Tammy Jernigan and John Olivas engaged visitors in question and answer sessions and signed autographs in the Latino Expo USA at the conference site. ■

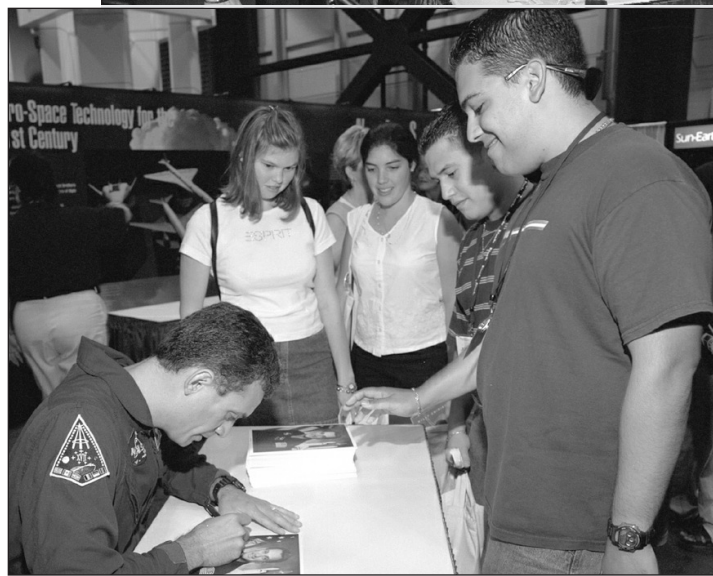
A potential future astronaut marvels at the astronaut spacesuit while attending the La Raza conference.



JSC Photo S99-08628



JSC Photo S99-08626



JSC Photo S99-08627

NASA Astronaut Candidate Dr. John "Danny" Olivas autographs hundreds of pictures for very pleased attendees at the National Council of La Raza Conference.

Connie Sartor of JSC's Technology Transfer and Commercialization Office made quite an impression on attendees who were surprised to know how much of NASA's space program translates into everyday, down-to-earth use.

**Team completes upgrades to station mockups**

To assist the International Space Station Program Office in managing stowage assessments and to enable crewmembers to train on the stowage configuration they should see on orbit, the Zarya and Service Module mockups in the Space Vehicle Mockup Facility in Bldg. 9 at JSC have been upgraded and modified.

This work was first completed for the crew of STS-96, ISS assembly flight 2A.1 flown earlier this year, and more modifications have recently been completed for STS-101, assembly flight 2A.2, scheduled for December. The mockup panels, panel doors, stowage areas, and hardware protruding into the open areas have been modified to reflect the flight configuration.

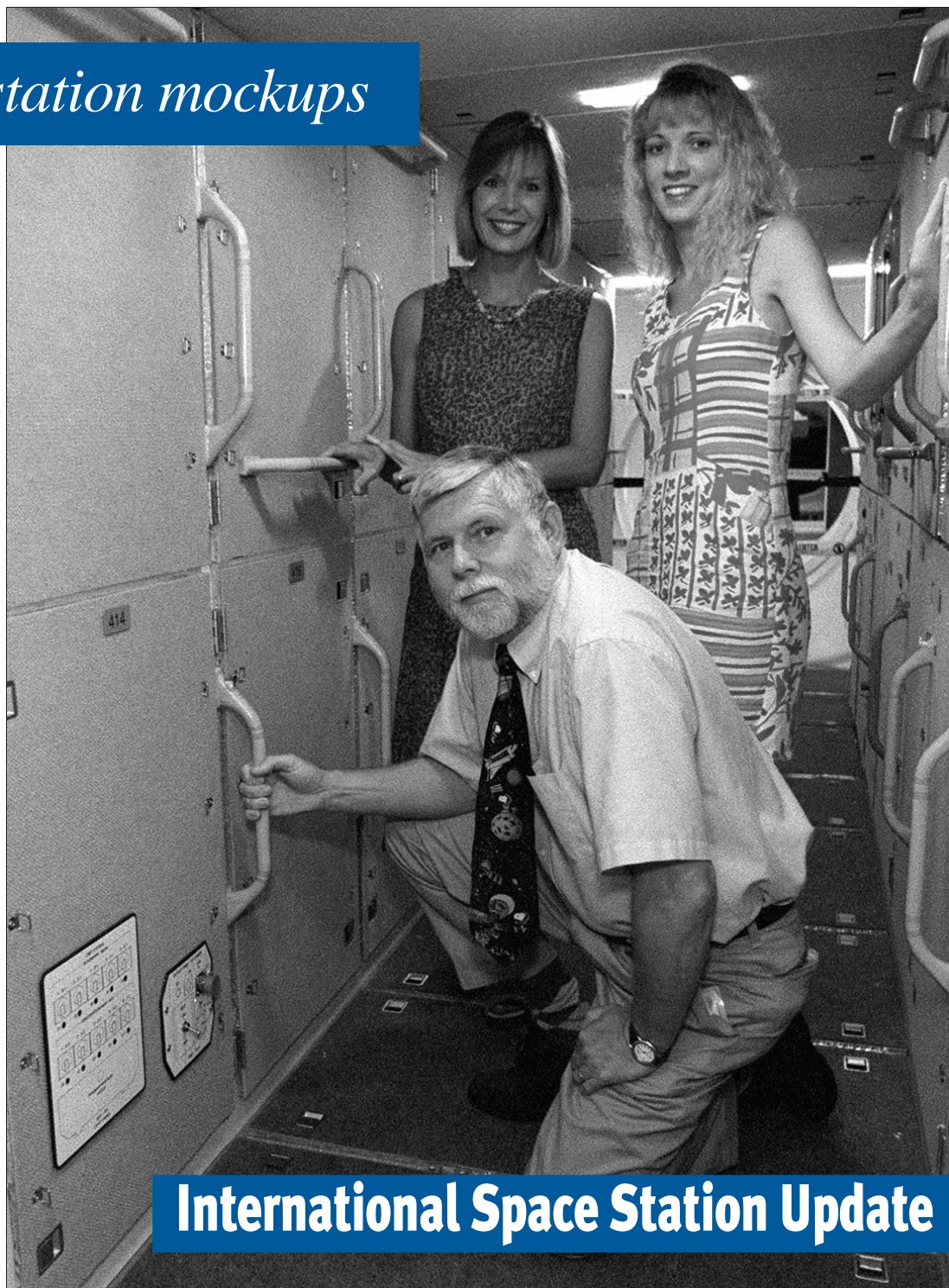
John Sims, chief of the Space Vehicle Mockup Facility, commented, "We are well on our way to having a first-class facility to augment the high-fidelity mockups at Star City, Russia."

Tommy Capps, Russian mockup manager for the Space Vehicle Mockup Facility in the Mission Operations Directorate, has been instrumental as the project engineer and lead for the upgrades to the mockups. Capps integrated the requirements with the ISS Program Office and is currently working with the Russians to integrate future upgrades and the development of higher fidelity mockups of the Russian modules.

"This has been a tremendous team effort on behalf of the NASA and contractor force," said Capps. "Having worked from the onset of the Shuttle-Mir Program, I am very pleased now to see the transition of a lot of the lessons learned from Phase I into the ISS Program. Much of the hardware, stowage, and operational problems are the same. It has been very rewarding to watch this effort develop and to see the JSC community come together to support the ISS Program. Although we have a lot of work to do to get to the fidelity level we want in the mockups, this is a great start."

The Zarya and Service Module mockups provide a means for NASA to develop operations concepts for the activities on board the International Space Station. Using these mockups, the crewmembers have the opportunity to train on the stowage configuration they should see on orbit and procedure personnel are able to verify the accuracy and workability of their procedures.

In addition, the mockups of Zarya and the Service Module serve as tools to ensure crew safety, mission success, and communication within NASA and with the public. Capps explained that "by using mockups we in NASA can evaluate such things as the workability of a procedure, the safety of a process or procedure, and the environment in which the crew must perform work. It is often important to explain concepts and on-orbit problems to both the technical community and the public. Mockups provide the visual cues needed to facilitate this communication process." ■

**International Space Station Update**

JSC Photo S99-09104

Shown in the FGB mockup are front: Tommy Capps manager, Russian Module Mockups, Space Vehicle Mockup Facility, MOD; left back: Liz Kalla, ISS Program Office, stowage manager and Ursula Callaway-Stockdale, MOD Cargo Operations manager.

ISS viewing opportunities from the ground can be found on the Internet at: <http://spaceflight.nasa.gov/realdatasightings/>



# Plasma propulsion technology heats up at Advanced Space Propulsion Laboratory



The VASIMR research team at the ASPL standing, from left: Dr. Andrew Ilin, Lockheed Martin; Tim Glover, Rice University; Dr. Jared Squire, Muniz Engineering; Dr. Franklin Chang-Díaz, JSC/NASA; Garland "Buddy" Goebel, Boeing; Greg McCaskill, Lockheed Martin; Scott Winter, JSC/NASA; front: Jeff George, JSC/NASA; Tri Nguyen, JSC/NASA; Tim Graves, Texas A&M University; Kristy Stokke, MIT; Carol Dexter, MSFC/NASA; Andy Petro, JSC/NASA. Several government partner organizations such as MSFC, GSFC, GRC, LaRC, and the Department of Energy's Oak Ridge National Lab also contribute to VASIMR research.

By Nicole Cloutier

Student researchers teamed with veteran scientists and engineers at the Advanced Space Propulsion Laboratory at the Sonny Carter Training Facility are developing a new method for propelling spacecraft. Known as the Variable Specific Impulse Magnetoplasma Rocket (VASIMR), this new propulsion technology promises faster space travel, the ability to go farther with increased load capability and possible creation of artificial gravity in space, as well as effective radiation protection for astronauts.

Contrary to the conventional rockets in use today, which use chemical reactions for their power, VASIMR represents a revolutionary new rocket technology that uses plasma as a propellant.

## How it works

Sometimes known as the fourth state of matter, plasma is a gas heated to a very high temperature (tens of thousands to millions of degrees). Although plasma is relatively scarce on Earth, appearing as the glowing material inside flames and lightning, it makes up 99 percent of the universe including the Sun and stars.

In this case, hydrogen or helium is used as the gas. Hydrogen is preferred because it produces the highest exhaust velocity. And because hydrogen is the best insulator against most types of space radiation, it will be stored externally on the VASIMR to protect the crew from radiation exposure.

The gas is released into a feeder tube that is surrounded by a special antenna called a helicon. The helicon produces radio waves that excite the atoms and heat the gas to approx-

imately 50,000 °F. At that temperature, the electrons and ions separate from the atoms and plasma is created.

The plasma is further heated by electromagnetic waves to temperatures of 1 million degrees or higher. At those extreme temperatures there is no known material that can endure contact with the hot plasma, so researchers use a magnetic field to contain and guide the plasma toward the exhaust cell of the VASIMR.

In this cell, the magnetic field forms a magnetic nozzle that both accelerates the plasma and ensures its efficient separation from the guiding field. At this stage, the plasma heat is converted to kinetic energy and produces thrust.

"One key feature of the VASIMR is its capability to vary the properties of the exhaust over a wide operational range," said Dr. Franklin Chang-Díaz, NASA astronaut. "This enables the rocket to 'adapt' to the conditions of flight similar to the way an automatic transmission adapts the car engine to the hills and valleys of the road. In space we travel in hilly terrain, the hills and valleys of the gravitational fields of the Sun, planets and moons."

## Current work

All of the work on VASIMR is done with interplanetary travel in mind.

"VASIMR has better gas mileage for interplanetary travel," said Dr. Mark Carter, a collaborating researcher from

## VASIMR Benefits

VASIMR technology resolves many issues that hinder long-term space flight today.

- ◆ Power efficiency: Improved payload mass fraction;
- ◆ Faster interplanetary travel: Reduced travel time to Mars from six months to three;
- ◆ Physiological benefits: Reduced negative physical effects from long-term weightlessness and the psychological toll of confinement. Also, reduced radiation exposure when hydrogen propellant is stored in external tanks on the vehicle to shield the crew;
- ◆ Improved abort capability: VASIMR technology could be utilized to offer more expedient Earth-return maneuvers for human deep-space exploration or planetary habitation;
- ◆ Artificial gravity: During interplanetary travel, VASIMR would accelerate to the mid-point and then reverse itself for the remaining half of the journey. While the acceleration levels are still very low, they are nevertheless continuous. Future VASIMR rockets operating at high power levels could increase this effect considerably. The medical community is now evaluating these benefits in the context of human missions to Mars.
- ◆ A path to fusion rockets: In the near term, VASIMR propulsion is "driven" by solar arrays or an external fission reactor producing the required electrical power to heat and eject the plasma. In the long term, the plasma itself, if sufficiently hot and dense, could trigger its own thermonuclear fusion reaction, producing copious amounts of power internally. In this future embodiment, the VASIMR will become a fusion rocket, providing a breakthrough propulsion capability, which will change human space travel as we know it today. ■

the Department of Energy. "It needs less propellant and yet is able to fly faster with increased payloads."

Proposed use of VASIMR technology includes travel to Mars in a popular concept dubbed "split-sprint." The first mission uses an automated VASIMR vehicle to transport a large payload of supplies, fuel and habitat to Mars. The second shipment, faster and with a smaller payload, delivers crew and additional supplies to the Mars site.

After more than two decades of research and testing in the lab environment, VASIMR is slated for its debut space flight in 2003.

The proposed flight is the Radiation and Technology Demonstration mission. VASIMR will be one of two experimental propulsion devices flown by the RTD spacecraft several thousand kilometers above the Earth.

"This is an exciting time for everyone on the team," said Andrew Petro, NASA integration engineer. "We have VASIMR physics pretty well understood. Now we're concentrating on the engineering and design challenges."

"The work we are doing here makes me think of what it must have been like in the 'old days' when physics and engineering were going hand in hand and discovery was just around the corner," said Chang-Díaz. "I see the young physicists, engineers and technicians in my lab tackle engineering problems for which the physics are not yet known – they must develop it as they go. This is what research is all about and I love every minute of it. To me this is the essence of NASA and I feel truly fortunate to be a part of it."

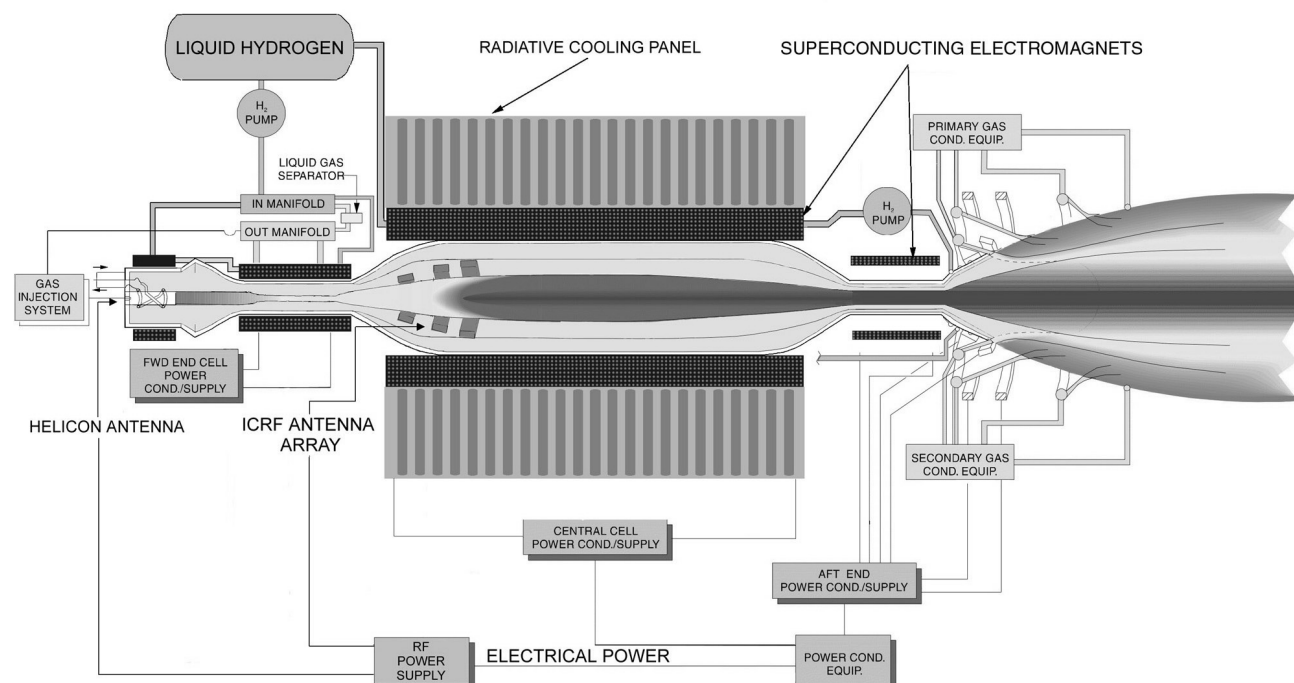
## How it started

Chang-Díaz initiated VASIMR research in 1979 at the Charles Stark Draper Laboratory in Cambridge, Massachusetts. He was selected as a NASA astronaut in 1980, but continued VASIMR development at The MIT Plasma Fusion Center as a visiting scientist from JSC. Committed to the concept of alternative propulsion systems, Chang-Díaz founded the ASPL in December 1993 to carry out VASIMR research.

A local team of 20 scientists, engineers, technicians and students staff the laboratory. In addition, the ASPL brings together a bigger team of collaborators from government partner organizations as well as private industry and a half dozen universities. The ASPL also provides training for many students at the undergraduate and graduate levels.

"The students are a crucial part of this research," said Chang-Díaz. "They represent the next generation of space travelers, and they are the ones who will need to explore the alternatives that will enable us to pursue interplanetary travel and habitation."

The future looks very promising for VASIMR and plasma propulsion technology. In the meantime, Chang-Díaz is happy to see alternative technologies emerging. ■



Hydrogen, one of two gases that could be used to create the plasma, would be stored on external tanks and used to protect the crew from radiation in space.



# Co-ops explore career options, gain valuable experience

By Jenny R. Gruber

Through cooperative education, college students gain work experience in their fields of study by taking time off from school to work full time at a variety of corporations and agencies.

JSC's Cooperative Education Program began in March 1961. Currently, Co-op Program Manager Bob Musgrove runs the program, with the assistance of Sharon Evans. According to the co-op Web page (<http://www.jsc.nasa.gov/coop/jsc-coop.html>), there are about 150 students in the program representing 45 schools. The majority of co-ops are engineering majors, but there also are students from other technical, scientific and business-related fields.

John Osborn, a computer science and astronomy double-major at the University of Texas, is working in the Cargo Integration and Operations Branch training the Assembly and Checkout Officer Flight Control Team on Russian systems, like the Zarya and Progress spacecraft. Osborn says, "The JSC co-op program gives university students a chance to serve in a project larger than themselves as a member of a highly qualified team."

Co-ops at JSC have a wide selection of projects to choose from. Current co-op projects include:

- ◆ Making a financial systems reference guide for budget analysts;
- ◆ Designing the first console display unique to the Flight Director's Office;
- ◆ Working on a classical flight control system for X-38 Vehicle 201, including development of nonlinear 6-degree-of-freedom simulations using the Spacecraft Engineering Simulator and linear analysis tools used to assess the stability and control characteristics of the vehicle, and
- ◆ Designing, analyzing, and testing the TransHab bladder seal interface for the next development unit;
- ◆ Developing and employing mission planning software to assess performance for trans-Mars injection.

Both students and employers benefit from the co-op program. Ron Sostaric is an aerospace engineering major at Georgia Tech and a co-op in Aeroscience and Flight Mechanics, Advanced Mission Design. Sostaric is working on running entry simulations for landing a manned

vehicle on Mars and helping to tune the guidance in order to minimize the landing footprint. According to Sostaric, the co-op program "is a worthwhile and beneficial program to both the participants and the permanent employees at the center. Many

divisions are used to working with co-ops and have significant expectations of them. The co-op experience really helps students put school in perspective in terms of their careers. For some of us, it is a chance to fulfill a lifelong dream of being able to contribute to the nation's space program and exploration of the universe."

Jennifer Sheppard, an aerospace engineering major at the University of Washington, is working with the orbit flight dynamics officers in the Flight Design and Dynamics Division, Orbit Flight Dynamics Branch. Sheppard believes that co-oping with NASA is a "wonderful opportunity" and says, "It won't be too long before most or all students getting engineering degrees will have co-op experience as part of their

education. I figure that it's better to be on the crest of the wave than to be left behind."

Co-oping is a serious opportunity for students to explore career options, but it can also be enjoyable and rewarding. Jennifer Glassley, an electrical engineering major at Purdue University working as the communications/video project engineer for NASA's new technology spacesuits, sums up her experience as a co-op: "The co-op program has provided me with so many great experiences. I had the opportunity to be a field test project lead, as well as the lead electrical engineer for many other projects. I never would have imagined that I'd be a project engineer so early on in my career."

Most co-ops are very satisfied with their positions, and many agree that co-oping at JSC is even more exciting than they thought it would be. Angie Villar, a business management major at Texas A&M University, is working in Human Resources. Her projects include coordinating on-site training courses for employees, assisting the coordination of Russian expatriation training, and coordinating activities for the International Space School Foundation. According to Villar, "As a business major, I never expected to work in such a unique environment, but co-oping at JSC has given me the opportunity to be exposed to things I never dreamed of—an opportunity I am truly grateful for." ■

*I can't imagine a job where it's not common to run around in a spacesuit, fly on the KC-135, or swim in the Neutral Buoyancy Lab... This program was the best decision I've made so far in my life.*

— Jennifer Glassley



A number of college students spent their summer co-oping at JSC where they gained valuable work experience in their fields of study.

## NASA scholarship recipient launches career

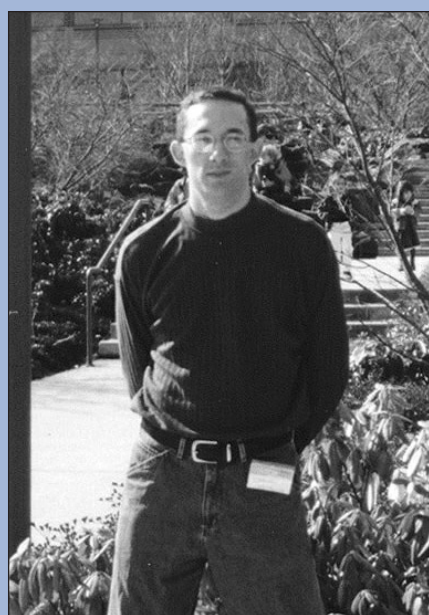
Keith Kelly, son of JSC's Albert Kelly, a contracting officer's technical representative for the training systems contract, is well on his way to a promising career in computer science, thanks partly to the NASA Scholarship Program.

Keith Kelly was named a NASA scholarship recipient in 1995 and with a diploma from Friendswood High School in hand, as well as honors from area science and engineering fairs, he embarked on a new phase of his life at nearby Rice University.

After four years of concentrated study and side jobs with various software and Web design companies, Keith

Kelly graduated from Rice University in May with a degree in electrical engineering. He's since begun another new phase in his life — this time among the tall fir trees and snow-capped mountain vistas of Seattle, Washington, where he's joined the ranks of Microsoft Corporation as a software developer.

"The NASA scholarship has been an encouraging reminder each year of my real reasons for working so hard in school," said Kelly in a thank you letter to NASA's Business Management Office. "The goal isn't just to make the grade, but to learn for the sake of self-betterment, and to be able contribute to the world in some positive way." ■



Keith Kelly, a 1995 NASA Scholarship recipient, stands in front of Microsoft Corporation's headquarters building in Redmond, Washington, where he has started his new career in software development.



# Ripped from the ROUNDUP

Ripped straight from the pages of old Space News Roundups, here's what happened at JSC on this date:

**1 9 6 4**

**T**he largest solid propellant rocket motor segment cast to date in the Free World rolled uneventfully last month over 25 miles of Southern California freeway and side streets from its manufacturing plant to the base where it will be test-fired in the fall.

Carried horizontally on a massive trailer over 100 feet in total length, the 140-ton center segment of Lockheed Propulsion Company's 156-inch diameter rocket motor is nearly 24 feet long. The additional length of the carrier vehicle is required to spread the weight over 64 wheels on eight axles.

**1 9 8 4**

**N**ASA will retrieve the Palapa B-2 communications satellite and return it to Earth on Space Shuttle Mission 51-A in November under the terms of an agreement signed Aug. 13.

The Palapa is in a circular orbit between 180 and 190 nautical miles. The *Discovery* will move in and keep about 200 feet from the satellite as the prime EVA crewmember flies over to the satellite with a Manned Maneuvering Unit. Astronauts Dale Gardner and Joe Allen are slated for the EVA tasks. Palapa B-2 was deployed from the Shuttle *Challenger* during STS-41B on Feb. 6.

**1 9 8 9**

**V**oyager 2 began its close encounter with Neptune this week, sending hundreds of images Earthward daily. As the aging spacecraft began its grand finale, it revealed tantalizing details about the planet and its two largest moons that, in some cases, refuted conclusions of just two weeks ago.

In the past few weeks scientists have discovered a magnetic field around the planet, located four moons to add to the two already known through observations from Earth, and confirmed the presence of previously predicted ring arcs (partial rings).



JSC Photo S99-08413

Deborah Mika treats nephew, Alex Conaway, 7, to a close-up look at the space shuttle cockpit trainer.

## Deborah Mika: *dynamo with a deft touch*

By Mary Peterson

**D**eborah Mika is today's woman: smart, ambitious, energetic, career minded, goal oriented, and with a built-in sense of diplomacy that would rival Henry Kissinger. She's Clark Kent in femme shoes, and, like Kent, you half expect her to chuck her horn-rimmed glasses, don a cape, and leap tall buildings. She also has a soft side. But, more on that later.

So, it's not surprising that when JSC needed a superhero to conquer the mountains of VPP work, and in not much time, Mika (pronounced Mee-kah), the safety projects lead for Hernandez Engineering, Inc., was tapped for the job.

"It was a big challenge," said Mika, "and I was still pretty new to JSC. My predecessor had left for another company, so there was very little opportunity for transition. And, wow! Trying to motivate and educate some 13,500 people in a complex like JSC could make anyone's knees turn to rubber."

But, rise to the task she did, and she was instrumental in getting the VPP application produced on time, along with organizing the 19-element exhibit books, and subsequently working with Bill Klingbeil, the OSHA VPP Region VI manager, during the all-important on-site audit. She, in fact, worked so well with the OSHA-VPP group that Klingbeil invited her to join their team in other external audits, as time permits.

Mika has a rare talent for assessing situations, organizing a strategy, setting goals, and eliciting the best from coworkers to achieve an end, all the while making them feel good about themselves and what

they've accomplished together. Where did this ability come from? "Probably from growing up in a large family," she will tell you. "You learn a lot about give and take, and, well, how to negotiate. If I wanted my little brother to fix my car, for example, I would make an offer - something like, 'I'll iron your shirts for two weeks.' If he said 'no' to this, I'd say... 'and give you an extra 10 bucks for the dance on Friday.'" Most of the time it worked. You learn to consider the feelings and needs of others."

Beyond the tough, professional exterior, Mika's soft side is manifest at the very mention of her 7-year-old nephew, Alex Conaway, who has been the object of her intense attention and affection since what could have been a life-altering freak accident. "He was playing and fell on a shovel," Mika recalls, "piercing his right ankle." From the wound, a fungus developed, ultimately causing bacteria to grow in the hematoma and eat away at the ankle bone, raising the ominous possibility of crippling, or in the worst case, amputation below the knee.

Even at the early age of 6, when the injury first occurred, young Alex perceived that his would not be an easy road. In an especially poignant moment, he asked his mom, "Would you miss me?" Pretending not to understand, she replied, "Alex, I don't know what you mean." He said, "Well, you know, if I died, you really would miss me." After tender hugs and reassurances, the young boy was able to accept the risk of nine subsequent surgeries with courage and a positive attitude. Although he tires easily and relies occasionally on crutches, Alex

has emerged the typical, mischievous little boy, yet well-tempered and well-mannered. "He's my hero," says Mika, "although," she added, "he thinks I'm his."

Alex, so proud of his Aunt-Who-Works-at-NASA, is not above telling his friends he "thinks" she's an astronaut. If not one, she comes close in his books. When in the hospital, Mika took him some space food that included pizza and an ice cream sandwich, along with posters, a play shuttle, and other space stuff. Alex thumbs-downed the pizza, even though, in his words, "I usually like pizza a lot," but gave an A-OK on the ice cream sandwich. And, to cap off his space fantasies, Aunt Deborah hosted him, his mom, and younger sister, Aimee, 6, on a recent tour of JSC, so he could see the real thing. Equally important, Alex wanted to personally thank his aunt's coworkers who kept him in their prayers.

Mika, whose career moves have taken her from the nuclear weapons industry to the space industry, has lived and worked in Nevada, Colorado, and now Texas. She was born in Karnes City, Texas, near San Antonio, and has a degree in business administration from University of Houston and a master's degree in environmental policy and management from the University of Denver.

Where does Mika see herself in 10 years? "With a satisfying career and a happy home life," she says. Single, she looks forward to the day she will have an Alex of her own, maybe more, although she admits, "There will always be only one, true Alex in my heart." ■

## TICKET WINDOW

### Exchange Store hours

Monday-Friday

Bldg. 3 7 a.m.-4 p.m.

Bldg. 11 9 a.m.-3 p.m.

All tickets are nonrefundable.

Metro tokens and value cards are available.

For more information, please call x35350.

The following discount tickets are available at the Exchange Stores:

General Cinema Theaters	.....	\$5.50
Sony Loew's Theaters	.....	\$5.00
AMC Theaters	.....	\$4.75
Fiesta Texas	.....adult ..\$18.25 ..(child under 48") ..	\$15.50
Astroworld One-day Admission	.....	\$21.00
Astroworld Season Pass	.....	\$54.75
(valid at all Texas Six Flags Theme Parks and Water World)		
Water World	.....	\$10.75
Moody Gardens (2 of 6 events) ticket does not include Aquarium Pyramid	..	\$10.75
Sea World	.....adult ..\$27.25 ..child (age 3-11) ..	\$18.25
Schlitterbahn Water Park	.....adult ..\$20.75 ..child (age 3-11) ..	\$17.50
Space Center Houston	.....adult ..\$10.25 ..child (age 4-11) ..	\$6.50
Space Center Houston Annual Pass	.....	\$18.75
(JSC civil service employees free.)		
Splash Town Water Park	..... adult ..\$14.50 (child 48" and under) ..	\$11.50





# Arthur Moody

## A profile of one of JSC's familiar faces

**F**ew have passed through JSC's gates without ever seeing the gleaming smile of Arthur Moody.

For more than 30 years, Moody has manned guard stations throughout the center and Ellington Field as an OMNISEC International employee. For many, it's his enthusiastic presence that greets them every morning.

"Mr. Moody's enthusiasm for living is contagious!" said JSC Center Director George W. S. Abbey. "He is a conscientious and dedicated employee who easily chases troubles away with his cheery smile."

"He was always in Building 1," said Aaron Cohen, former JSC director, from his post at Texas A&M University. "He always gave me a bit of friendly advice as I came in each morning – different things from his observations around the center about ways we could improve security or working conditions, and I always listened to what he had to say."

In fact, Cohen esteems Moody so much that he invited Moody to speak at his retirement ceremony in 1993. "Mr. Moody is very dedicated, has a good work ethic and a desire to do a good job for JSC," added Cohen. "He's the epitome of what a good employee should be."

Moody's strong character likely is the result of his diverse background. Born in Mobile, Ala., Moody's family moved to New York when he was 12. Teenage jobs

as a bell hop and elevator operator in the Times Square district sparked a desire to see the world and, at age 18, Moody enlisted in the U.S. Merchant Marine.

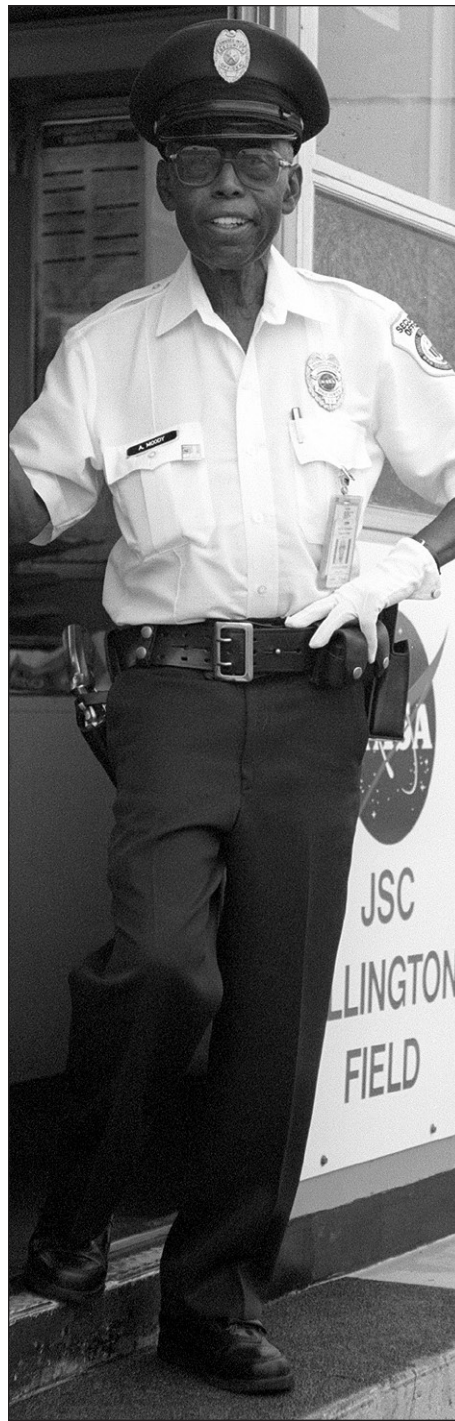
"I've traveled around the world seven times during my 21 years in the Merchant Marine," said Moody. "You can ask me anything about any place and I'll know it 'cause I've been there. I can teach those astronauts tricks!"

Moody also believes it was his exposure to so many different cultures that has made him such an impressive ambassador to JSC visitors and VIPs. "I was frequently posted in Mission Control during missions," he said. "I can relate to many of the international visitors and give them a good first impression of NASA."

On board the ship, Moody worked a variety of jobs, working as a deck hand or a cook, whatever needed to be done. Because the Merchant Marine transported commercial cargo around the globe, Moody frequently had his choice of destination.

"Initially, I traveled a lot to Europe," said Moody. "But then I tired of going to Europe, so I went to the Far East. Then to Africa – Cape Town, Ethiopia and Calcutta – you name it, I've been there."

Moody's pace didn't slow till years later, when he met his wife, Theresa, while in port in Galveston. They married in 1958, settled in Alvin and had five children. He joined JSC as a security guard in April 1969 and has been working here



Arthur Moody

JSC Photo S99-07642

*“He is blessed with the ability to make people smile and appreciate the wonderful world they live in everyday”*  
– Steven Sumner

since, sharing in many of NASA's historic moments.

"I was here, in the MCC crowd, waving my American flag during the Moon landing," said Moody. That was more than 30 years ago and Moody says he has made a lot of friends here in that time.

"I was once assigned as Buzz Aldrin's escort at an Apollo 11 anniversary event," said Moody. "And as we walked around, more people started coming up and talking to me. Mr. Aldrin turned around and said, 'I'm not going around with you anymore because you know more people here than I do!'"

Moody also was a designated escort to transport the lunar samples when they first arrived at JSC, and was frequently assigned as a guard for astronaut residences. He refers to former JSC legends such as Dr. Gilruth and Gene Kranz as friends.

"He is blessed with the ability to make people smile and appreciate the wonderful world they live in every day," said Steven Sumner, chief of Security and Moody's project manager. "He reminds me of a 'short little firecracker' with a smile from ear-to-ear that never disappears."

A reputation like that makes Moody crack a grin. "I love communicating with all people," said Moody. "Some folks are nice, some are very nice, and some are not so nice, but I am here to try and make them all a little happier." ■

# Secretaries receive Bockting award for excellence

**A**rlene Andrews of the Mission Operations Directorate, M. Helen Hickman of the Flight Crew Operations Directorate, and Melissa P. Martinez of the Information Systems Directorate were recently presented with Marilyn J. Bockting Secretarial Excellence Awards in recognition of their exceptional contributions to the effective operation of JSC through professional competence and personal dedication.

Andrews was recognized in May for her contributions as secretary of the Portable Computer Systems Office. She quickly created an atmosphere of

efficiency and professionalism in the office after several months without a secretary. As part of her duties, she keeps track of all of the workstations and laptops in the office, including overseeing the configuration management system update requirements paperwork. As a result of her efforts, not one of the workstations or laptops has been misplaced. She has made contributions of her time and effort to make the office function more efficiently and has provided outstanding support to all members of the office.

Hickman was recognized in June for

her outstanding secretarial skills. She is dedicated to providing superior administrative support to the chief of the Vehicle Integration Test Office as well as to the entire office. She has been helpful in transitioning VITO to its new management. She has provided support to other offices, implemented efficiency methods, and reorganized the physical layout of the office to eliminate potential safety hazards.

Martinez was recognized in July for her contributions as secretary of the Information Services Office. This office requires a very knowledgeable and

customer service-oriented secretary. Martinez is excellent at dealing effectively with center customers and matching their service requirements with the appropriate ISO personnel. She interacts with a very diverse group of office employees with an equally diverse range of communication skills and is always courteous and patient in her attempts to distribute general information to all employees. In addition, she was instrumental in converting all office personnel over to the electronic timecard system in a very short time. ■



Helen Hickman

JSC Photo S99-07214



Arlene M. Andrews

JSC Photo S99-07213



Melissa P. Martinez

JSC Photo S99-07216



**GILRUTH CENTER NEWS**<http://www4.jsc.nasa.gov/ah/exceaa/Gilruth/Gilruth.htm>

**Hours:** The Gilruth Center is open from 6:30 a.m.-10 p.m. Monday-Thursday, 6:30 a.m.-9 p.m. Friday, and 9 a.m.-2 p.m. Saturday. Contact the Gilruth Center at (281) 483-3345.

**Sign up policy:** All classes and athletic activities are on a first-come, first-served basis. Sign up in person at the Gilruth Center and show a yellow Gilruth or weight room badge. Classes tend to fill up two weeks in advance. Payment must be made in full, cash or by check, at the time of registration. No registration will be taken by telephone. For more information, call x33345.

**Gilruth badges:** Required for use of the Gilruth Center. Employees, spouses, eligible dependents, NASA retirees and spouses may apply for photo identification badges from 7:30 a.m.-9 p.m. Monday-Friday and 9 a.m.-2 p.m. Saturdays. Cost is \$10. Dependents must be between 16 and 23 years old.

**Nutrition intervention program:** Six-week program includes lectures, a private consultation with the dietitian and blood analysis to chart your progress. Program is open to all employees, contractors and spouses. For details call Tammie Shaw at x32980.

**Defensive driving:** One-day course is offered once a month at the Gilruth Center. Pre-registration required. Cost is \$25. Call for next available class.

**Stamp club:** Meets every second and fourth Monday at 7 p.m. in Rm. 216.

**Weight safety:** Required course for employees wishing to use the Gilruth weight room. Pre-registration is required. Cost

is \$5. Annual weight room use fee is \$90. The cost for additional family members is \$50.

**Exercise:** Low-impact class meets from 5:15-6:15 p.m. Mondays and Wednesdays. Cost is \$24 for eight weeks.

**Step/bench aerobics:** Low-impact cardiovascular workout. Classes meet from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is \$32 for eight weeks. Kristen Taragzewski, instructor.

**Yoga:** Stretching class of low-impact exercises designed for people of all ages and abilities in a Westernized format. Meets Thursdays 5-6 p.m. Cost is \$32 for eight weeks. Call Darrell Matula, instructor, at x38520 for more information.

**Ballroom dancing:** Classes meet from 6:30-7:30 p.m. Thursdays for beginner, 8:30-9:30 p.m. for intermediate and 7:30-8:30 p.m. for advanced. Cost is \$60 per couple. **Country and western dancing:** Beginner class meets 7-8:30 p.m. Monday. Advanced class (must know basic steps to all dances) meets 8:30-10 p.m. Monday. Cost is \$20 per couple.

**Fitness program:** Health-related fitness program includes a medical screening examination and a 12-week individually prescribed exercise program. For more information call Larry Wier at x30301.

**Fall league registration dates:**  
*Softball* Aug.30-Sept.11 *Flag Football* Aug.30- Sept.11  
*Basketball* Aug.23- Sept.4 *Volleyball* Aug.23- Sept.4  
 For more information on leagues call x33345.

**DATES & DATA****September 1**

**Astronomy seminar:** The JSC Astronomy Seminar Club will meet at noon September 1, 8 and 15 in Bldg. 31, Rm. 248A. For more information, call Al Jackson at x35037.

**Spaceland Toastmasters meet:** The Spaceland Toastmasters will meet at 7 a.m. September 1, 8 and 15 at the House of Prayer Lutheran Church. For more information, call George Salazar at x30162.

**Spaceteam Toastmasters meet:** The Spaceteam Toastmasters will meet at 11:30 a.m. September 1, 8 and 15 at United Space Alliance, 600 Gemini. For more information, call Patricia Blackwell at (281) 280-6863.

**September 2**

**Communicators meet:** The Clear Lake Communicators, a Toastmasters club, will meet at 11:30 a.m. September 2, 9 and 16 at Freeman Library, 16602 Diana Lane. For details, call Allen Prescott at (281) 282-3281 or Mark Caronna at (281) 282-4306.

**Warning System Test:** The site-wide Employee Warning System will perform its monthly audio test at noon September 2. For more information, call Bob Gaffney at x34249.

**September 8**

**Software conference:** The third annual All Texas Pro/ENGINEER Users' Conference will be held September 8-10 at the San Luis in Galveston. Conference registration information can be found at [www.prouser.org/rugs/ghpug](http://www.prouser.org/rugs/ghpug).

**IAAP meets:** The Clear Lake/NASA chapter of the International Association of Administrative Professionals will meet at 5:30 p.m. September 8 at Bay Oaks Country Club. Cost is \$16. For additional information and reservations, call Tami Barbour at (281) 488-0055, x238.

**September 9**

**Airplane club meets:** The Radio Control Airplane Club will meet at 7 p.m. September 9 at the Clear Lake Park building. For more information call Bill Langdoc at x35970.

**MAES meets:** The Society of Mexican-American Engineers and Scientists will meet at 11:30 a.m. September 9 in Bldg. 16, Rm. 111. For more information, call George Salazar at x30162.

**September 10**

**Astronomers Meet:** The JSC Astronomical Society will meet at 7:30 p.m. September 10 at the Center for Advanced Space Studies, 3600 Bay Area Blvd. For more information, call Chuck Shaw at x35416.

**September 12**

**Westside NSS meets:** The Westside group of the Clear Lake area chapter of the National Space Society will meet at 2 p.m. September 12 at Silicon Graphics, 11490 Westheimer, Suite 100. For details, call Murray Clark at (281) 367-2227.

**September 14**

**Aero Club Meets:** The Bay Area Aero Club will meet at 7 p.m. September 14 at the Houston Gulf Airport clubhouse at 2750 FM 1266 in League City. For more information call Larry Hendrickson at x32050.

**NPMA Meets:** The National Property Management Association will meet at 5 p.m. September 14 at Robinette and Doyle Caterers, 216 Kirby in Seabrook. Dinner costs \$14. For more information call Sina Hawsey at x36582.

**September 15**

**Scuba club meets:** The Lunar fins will meet at 7:30 p.m. September 15. For additional information, call Mike Manering at x32618.

**September 16**

**NSS meets:** The Clear Lake area chapter of the National Space Society will meet at 2 p.m. September 16 at the Freeman Memorial Branch Library, 16602 Diana Lane. For more information, call Murray Clark at (281) 367-2227.

**NASA BRIEFS****NASA, FAA PICK STUDENT AIRCRAFT-DESIGN WINNERS**

A new jet design by students at Embry-Riddle Aeronautical University in Daytona Beach, Fla., has won NASA's and the FAA's 1998-99 National General Aviation Design Competition.

NASA and the FAA presented awards to Embry-Riddle at a ceremony held at AirVenture '99, the Experimental Aircraft Association's Annual Convention and Fly-In at Oshkosh, Wis. Thirty-three Embry-Riddle students worked on the design, aimed at attracting customers who want to move from propeller-driven craft to jets without needing a significant increase in pilot skill. The New Piper Aircraft, Inc. assisted the team in developing design specifications, which are consistent with national goals to revitalize general aviation.

Second place honors went to Pennsylvania State University for "The Baracuda," an acronym for Boldly Advanced and Refined Aircraft Concept Under Development for AGATE, a national general aviation revitalization program.

Third place was awarded to a three-university team from the University of Virginia in Charlottesville, Va.; Old Dominion University in Hampton, Va.; and Pratt Institute in Brooklyn, NY, for a highly innovative design known as the "Yeah Man," which has two tail booms with vertical tails.

Guidelines for the 1999-2000 competition can be found on the Internet at: <http://www.vsgc.edu.edu>

**SOFTWARE MAKES CARS SAFER AND SPACECRAFT CHEAPER**

NASA has chosen as its 1999 NASA Software of the Year two innovative programs developed at NASA centers. One program applies technology developed for space to everyday life here on Earth by helping to make our cars, airplanes, bridges and other structures safer. The other program makes spacecraft cheaper and transforms science fiction into science fact by allowing spacecraft to operate themselves.

The award winners are: Genoa, a failure-analysis software with unique predictive capabilities, and Remote Agent, which has been used to control NASA's Deep Space 1 mission.

Genoa simulates and predicts aging and failure in all sorts of structural materials, including high-tech alloys and ceramics used in airplanes, cars, engines and bridges. Genoa was submitted by the Glenn Research Center. The development of Genoa began at the center in the 1970s and was commercialized only about a year ago. A minority-owned small business is now marketing the software, which is used by aircraft manufacturers and others. It is the only software that can predict progressive aging and failure of materials as diverse as metals, ceramics, concrete and all types of composites. The ability to predict material and structural failure helps manufacturers build stronger aircraft fuselages, engines, car bodies, and bridges.

The second winner, Remote Agent, is a giant leap in the world of artificial intelligence. It is the first software package ever used to autonomously control a spacecraft: Deep Space 1. NASA scientists gave the software package primary command of the spacecraft for three days in May and it more than met expectations. The software detected, diagnosed and fixed problems, showing that it can make decisions to keep a mission on track.

**SPACE CENTER Roundup**

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