



# MARSHALL STAR

Serving the Marshall Space Flight Center Community

March 24, 2005

## Gen. Lord and Marshall talk possible partnerships

By Sanda Martel

The Marshall Center hosted Gen. Lance W. Lord, commander of Air Force Space Command at Peterson Air Force Base, Colo., who visited Huntsville March 15-16. His visit was part of a trip that also included stops at Arnold Engineering Development Center in Tullahoma, Tenn., Maxwell Air Force Base, Montgomery, Ala., and various Army elements located at Redstone Arsenal.

Marshall management officials met with Lord to discuss emerging launch and spaceflight technologies of interest to both NASA and the U.S. Department of Defense, and new ways in which NASA and the military can partner to take advantage of dual-use technologies. Of particular interest to the Air Force are launch vehicles with 2-metric-ton to 200-metric-ton lift capability. The Department of Defense also has expressed interest in leveraging

See Gen. Lord on page 9



Photo by Emmett Given/ Marshall Center

Gen. Lance Lord speaks at the Redstone Officers' and Civilians' Club on the topic of "Space: The Future of Military Power." The event was sponsored by the Alabama Coalition for Space Exploration and the Air Force Association, Tennessee Valley chapter.



Photo by David Higginbotham/ Marshall Center

Pat Patterson, payload operations director, works on the console at Marshall's Payload Operations Center. She will lead the team of flight controllers for Expedition 11.

## Payload Operations Center marks four years of support

By Lori Johnston

After years of planning and years of experience supporting Spacelab missions, Marshall Center's science Payload Operations Center is very real to the team who has "lived these early days of Space Station." March 19 marked the fourth anniversary of round-the-clock operations in support of NASA research aboard the International Space Station in the science control center.

"By living it, you really understand the team effort that goes into managing science on the Space Station," said Pat Patterson, a Payload Operations director at Marshall. "We all adjust to get the job done during the 24-hours a day – seven days a week operation."

Patterson was the first person on console leading the team of flight controllers, or the "cadre," in the Payload Operations Center when it went online March 19, 2001. Since then, flight control teams at Marshall have worked with nine Station crews, includ-

See Payload on page 10



## Welcome home soldier

Marshall Center team members brave the cold, damp weather to honor the return of the remains of Chief Warrant Officer Randolph Ard whose helicopter was shot down on March 7, 1971 near the Vietnamese-Laos border. He was buried Saturday in Albertville.

Photo by Ray Downward/ Marshall Center

## NASA recognizes Irish-American Heritage Month

*A message from Frederick D. Gregory, Acting NASA Administrator*

Without question, the strength of this great country lies in its diversity -- the collective spirit of unique individuals with shared ideals that enriches our culture and shapes our national identity. In keeping with this spirit, this month NASA is proud to stand with other agencies and organizations in recognizing all those Americans who trace their ancestry to Ireland's shores as we join together to celebrate Irish-American Heritage Month.

Like so many groups who immigrated to the United States, the Irish had to endure and overcome hardships, from famine to poverty and discrimination. Today, the legacy of community and commitment that they have given this country is a vital part of our nation's character.

The contributions of Irish-Americans are innumerable, and their influence can be seen throughout the history of our republic, from the Founding Fathers to the leaders of today. Nine of the 56 signers of the Declaration of Independence were Irish-Americans, as were 19 of the Presidents of the United States -- including George Washington, John F. Kennedy and Ronald Reagan.

Since NASA's inception, the success of this agency has been linked to the contributions of Irish-Americans. They have served in many capacities in our agency, as scientists, engineers, astronauts and more. Former NASA Administrator Sean O'Keefe was always very proud of his Irish heritage, and he and others have left a rich legacy for other Irish-Americans to follow.

The NASA Family is fortunate to count so many of these great people among us as our co-workers and friends. As you celebrate St. Patrick's Day this month, please take time to remember the enduring contributions of those Irish-Americans who have given this country and this agency so much.

## New software allows UAVs to perform virtual tests

*From NASA Headquarters Release*

The old saying, "birds of a feather, flock together," can be applied to two small uninhabited aerial vehicles (UAVs) flown in a NASA research experiment. The experiment uses principles derived from studies of fish and bird motions to simultaneously guide the vehicles around obstacles.

NASA recently completed flight tests over a "virtual" forest fire to evaluate new flight-control software to give UAVs the ability to autonomously react to obstacles, as they fly pre-programmed missions.

The tests were conducted over a remote area of Edwards Air Force Base, Calif., to investigate cooperative flight strategies for airborne monitoring and surveillance of natural disasters and for atmospheric sampling. Engineers and technicians from NASA's Ames Research Center, Moffett Field, Calif., and Dryden Flight Research Center, Edwards, Calif., conducted the flight tests.

"We developed and flight tested several novel approaches for providing assistance to wildfire suppression crews using a team of two small UAVs," said Ames' John Melton, principal investigator for the Networked UAV Teaming Experiment. "The aircraft were flown using a combination of rules from nature and robotics to cooperatively transit and search a virtual forest fire," he added.

The two autopilot-equipped, 12-foot wingspan APV-3 UAVs were built by RnR Products, Milpitas, Calif. They flew along computer-generated paths and demonstrated the ability to avoid obstacles in a cooperative and synchronized manner, all without the help of flight personnel.

The software also created waypoints on a rectangular grid of the search area, automatically developed individual flight plans and transmitted them to each vehicle. After passing their first few waypoints, one of the aircraft was commanded to begin orbiting over the virtual fire. The remaining search points were then transmitted to the second aircraft that incorporated these points into its flight plan and completed the mission.

# Raffaello prepares for Space Shuttle return to flight

*From Kennedy Space Center release*

The module that will deliver food, clothing, spare parts and research equipment to the International Space Station is being prepared for the Space Shuttle Return to Flight mission.

The Italian-built Multi-Purpose Logistics Module, Raffaello, is filled with cargo at NASA's Kennedy Space Center. It will fly on the Shuttle Discovery or STS-114 mission targeted for launch in May.

Raffaello will carry 12 large containers to the International Space Station. Included in the cargo is the Human Research Facility, HRF-2, which will expand the ISS capability to support human life sciences research. A similar facility, HRF-1, has conducted research since it was installed into the Destiny module in May 2001. The research includes using an ultrasound unit measuring bone loss and a gas analyzer system.

"This is a significant milestone for the Station," said Bill Gerstenmaier, ISS program manager. "With Raffaello's supply transport capabilities, we will be in a better posture onboard Station after this first Shuttle mission. Raffaello will also deliver a unique biomedical research capability with the HRF-2. It will help us learn more about humans living in space."

Returning the Shuttle to flight and completing the ISS are the first steps in the Vision for Space Exploration, a step-by-step strategy toward new exploration goals. Using the ISS to study human endurance, adaptation in space, to test new technologies and techniques, NASA will prepare for the longer journeys to the moon, Mars and beyond.

Biomedical instrumentation aboard HRF-2 includes a pulmonary function system for use in conjunction with exercise equipment

to obtain measurements of aerobic capacity and cardiac output; a refrigerated centrifuge used to separate biological substances of differing densities; a space linear acceleration mass measurement device to determine the on-orbit mass of crewmembers; and an upgraded workstation used for data handling and storage.

Scientific data generated by the HRF will provide insight into how crewmembers adapt to long-duration spaceflight and will assist in developing procedures to ensure crew health for longer journeys through the solar system.

The first of the supply racks was installed in Raffaello at KSC on March 4 and the HRF-2 rack was installed on March 8.

The Marshall Center manages the Multi-purpose Logistics Modules for the Space Station Program.

## ***A message from Eileen Collins, STS-114 commander:***

In just a few weeks, Discovery is scheduled to launch from the Kennedy Space Center. This is an important event in all our lives, not just the seven people who will fly aboard Discovery, but also the thousands of you whose work is making it possible for us to return the Shuttle fleet to space safely.

The past two years have challenged all of us to look closely at the work we do and ask 'how can I do this better?' For me personally, these challenges have brought renewed strength and commitment -- to my family, friends and coworkers, and to making sure I do the best possible job I can as Commander of this mission. I believe we are all stronger for having met these challenges, and that collective strength is allowing us to return to flight safely, complete the International Space Station, and move forward with the Vision for Space Exploration.

When Discovery lifts off the launch pad, my entire crew knows that we will carry your hearts and dreams with us. Thank you for your creativity, your dedication and your commitment.

## ***Return to Flight Updates***



**In the Vehicle Assembly Building at Kennedy Space Center, lead technician Todd Reeves, with United Space Alliance, attaches one of two bolt catchers on orbiter Discovery's External Tank. A bolt catcher is a vertical bolt mechanism at the forward end of the External Tank that attaches each booster to the tank. The bolt catcher is considered part of the Solid Rocket Booster element design.**

## ***Shuttle crew checks equipment***

The astronauts of the Space Shuttle Discovery got a chance March 18 to work with some of the equipment they will be taking to space. Flight commander Eileen Collins and her crew were at NASA's Kennedy Space Center, Fla., for the Payload Crew Equipment Interface Test.

The Return to Flight mission of the Space Shuttle (STS-114) is targeted for launch during a window from May 15 to June 3.

STS-114 is the first of two test flights following the Columbia accident. The seven-member Discovery crew will fly to the Station to evaluate procedures for flight safety, including orbiter inspection and repair techniques, and will deliver much-needed supplies.

The astronauts performed tests to ensure the equipment for the mission's three spacewalks worked properly, and they inspected the cargo containers installed in Raffaello. They performed fit checks on the Thermal Protection System (TPS) repair sample box, the Control Moment Gyro (CMG), and the External Stowage Platform-2 (ESP2).

## Obituaries

**Charles "Chuck" Allen**, 72, of Huntsville, died March 16. Mr. Allen retired from the Marshall Center in 1985 after working as chief photographer. He also served as international director of Toastmasters International and was a member of several Toastmaster clubs.

Survivors include his wife, Mary Allen; five children, Craig Allen, Jim Allen, Julie Allen Crane, Tom Allen, and Scott Allen.

**J.B. Broadway**, 79, of Union Grove, died Feb. 2. Mr. Broadway retired from the Marshall Center in 1975 after working as an aerospace engineering technician.

Survivors include his wife, Kathleene Broadway; two daughters, Patsey Sloan of Lacey's Spring and Joyce Winkles of Tennessee; four sons, Bobby Broadway of Arab, James Broadway of Union Grove, Charles Broadway of New Hope, and Rickey Broadway of Tennessee; a brother and five sisters.

**Dr. James B. Dozier Jr.**, 84, of Huntsville, died Feb. 27. Dr. Dozier retired from the Marshall Center in 1986 after working as director of the Office of Research and Technology. He served in the U.S. Army during World War II and was awarded the Purple Heart with oak leaf cluster and the Distinguished Service Cross, the second highest military award.

Survivors include his wife, Adriane Salay Dozier; and a son, Paul James Dozier of Huntsville.

**Morris K. Dyer**, 80, of Huntsville, died Dec. 9. Mr. Dyer retired from the Marshall Center in 1974 after working as a program manager in the Office of Safety and Mission Assurance. He was a veteran of World War II and a pilot who flew search and rescue missions with the Alabama Civil Air Patrol after the war.

Survivors include his wife, Geneva I. Dyer; a son, Robert C. Dyer; and a sister, Darlene Warren.

**George H. Fichtl**, 68, of Huntsville, died Feb. 17. Mr. Fichtl retired from the Marshall Center in 1994 after working as manager of the Microgravity Payload Projects Office. He

also served as manager of the Shuttle Systems Engineering Office at NASA Headquarters. He became a licensed registered pharmacist in Alabama and Florida after retiring from Marshall.

Survivors include his wife, Carrie Lee Fichtl; a daughter, Tamira Celeste Allbritten of Huntsville; and a sister, Florence McGinnis of Granada Hills, Calif.

**Ollie B. George**, 80, of Athens, died Feb. 17. Mr. George retired from the Marshall Center in 1987 after working as a welder. Survivors include his wife, Wilodean George.

**Gustav A. Kroll**, 90, of Huntsville, died March 1. Mr. Kroll retired from the Marshall Center in 1980 after working as chief of the Structures Division. He came to the United States in 1945 as a member of Dr. Wernher von Braun's team.

Survivors include his wife, Anni Luise Kroll; and a son, Ulrich Gustav Kroll.

**Jean D. McNamara**, 76, of Huntsville, died Feb. 16. Ms. McNamara retired from the Marshall Center in 1989 after working as a secretary.

Survivors include her children, Margaret M. Parcus and Edward F. McNamara, both of Huntsville, and J. Marie Pierce of Tuscaloosa, and Debbie L. Aldridge of Harvest; and a sister, Sharon L. Tucker of Huntsville.

**Charles E. Meadows**, 77, of Laguna Niguel, Calif., died Feb. 17. Mr. Meadows retired from the Marshall Center in 1987 after working as an aerospace engineer.

Survivors include his wife, Nancy B. Meadows and a son, Charles Meadows Jr.

**William M. Moon**, 89, of Huntsville, died Feb. 26. Mr. Moon retired from the Marshall Center in 1974 after working as an equipment specialist. He was a World War II veteran.

Survivors include his daughter, Cassandra Johnston of South Jordan, Utah; a son, William Marion Moon Jr. of Hunts-



Photo by David Higginbotham/ Marshall Center

### *Who's got the answer?*

**Paul Johnson of the Advanced Projects Assurance Department inspires the next generation of explorers during recent Space Week activities at Jones Valley Elementary School in Huntsville. Johnson is a volunteer with the Marshall Speakers Bureau, a function of the Government and Community Relations Office.**

ville; two sisters, Willa Ries Eslick Buckner of Meridianville and Ida Belle Clayton of Fayetteville, Tenn.

**Laverne S. Redden**, 84, of Huntsville, died Jan. 17. Mrs. Redden retired from the Marshall Center in 1974 after working a clerk typist. She was a charter member of the Mayfair Church of Christ.

Survivors include her daughter, Kaye Gray of Huntsville.

**Charles Swearingen**, 87, of Huntsville, died Jan. 5. Mr. Swearingen retired from the Marshall Center in 1979 after working as the chief of the mission computer division. He was a World War II veteran.

Survivors include his wife, Merle Swearingen; a daughter, Pat Swearingen Shaw of Hoover; and three sons, Keith Nathan Swearingen of Huntsville, Blake Swearingen of Raleigh, N.C., and Ken Priest of Huntsville.

*Obituaries continue on page 9*

# 35 selected for Space Flight Awareness honors



Thirty-five Marshall Center employees and contractors are being honored for their significant contributions to the space program. The honorees will attend a NASA Recognition Return to Flight event next week at the Gaylord Opryland Hotel in Nashville.



Tony R. Beaver, RS40



Ellis M. Bevill, MP51



Shirley R. Blair, QD30



Gary D. Bugbee, PS42



Lillian J. Campbell, DE01



Shane L. Carpenter, EI41



Raymond G. Clinton, XD40



Lana H. Cucarola, AD61



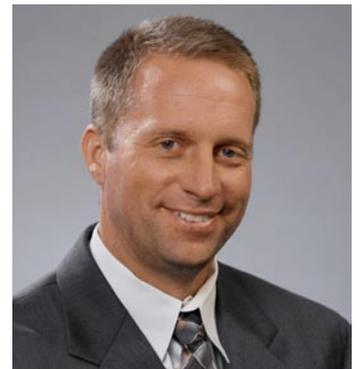
Charles D. DeWeese, EM40



Nathan S. Dougherty,  
Engineering Research and  
Consulting, Inc.



William J. Gentry, ED04



Cornelius E. (Neil) Glorie, Pratt &  
Whitney



**Brian K. Goode, ER43**



**Rodney P. Grubbs, IS04**



**John R. Hraba, XD30**



**Linda B. Jeter, SW10**



**Rosa M. Kilpatrick, CS30**



**Matthew D. Lansing, EM40**



**Robert M. Linner, MP31**



**Bradley P. Messer, MP32**



**Patricia A. Nash, AD41**



**Donna M. Prsha, SP31**



**Mark L. Richards, MP51**



**Michele L. Rochester, MP21**



**Patrick R. Rogers, EV31**



**Manuel V. Schultz, ET24**



**Richard L. Sizemore, Hernandez  
Engineering, Inc.**



**Howard A. SooHoo, ET13**



Randall H. Tucker, QD40



Michael S. Turner, UNITEs/SAIC



James L. Walker, EM20



Kenneth J. Welzyn, ED04



Gerald A. Wheeler, ERO2



Renee' M. Wilson, ET01



Robert C. Zeek, Teledyne Brown Engineering



## Evidence of elusive intermediate-mass black hole found

*From the Smithsonian's Astrophysical Center*

Peculiar outbursts of X-rays coming from a black hole have provided evidence that it has a mass of about 10,000 Suns, which would place it in a possible new class of black holes. The timing and regularity of these outbursts, observed with NASA's Chandra X-ray Observatory, make the object one of the best candidates yet for a so-called intermediate-mass black hole.

Scientists have strong evidence for the existence of stellar black holes that are about 10 times as massive as the Sun. They have also discovered that supermassive black holes with masses as large as billions of Suns exist in the centers of most galaxies. Recent evidence has suggested that a new class of black holes may exist between these extremes – intermediate-mass black holes with masses equal to thousands of Suns.

"It is important to verify the existence of intermediate-mass black holes, because they would bridge the gap between stellar-mass black holes and supermassive black holes

in the centers of galaxies," said Jifeng Liu of the University of Michigan in Ann Arbor, and lead author on a paper describing their discoveries that appeared in the March 1 issue of the *Astrophysical Journal Letters*. "Our observations don't settle the debate, but the behavior of this object is strong evidence in favor of their existence."

Liu and his colleagues used Chandra to observe a black hole in the galaxy Messier 74, or M74, which is about 32 million light years from Earth. They found that this source exhibits strong, nearly periodic variations in its X-ray brightness every two hours, providing an important clue to the black holes' mass. The black hole also fell into a class of sources called ultraluminous X-ray sources, or ULXs, because they radiate 10 to 1,000 times more X-ray power than neutron stars and stellar mass black holes.

Some astronomers believe these mysterious ULXs are more powerful because they are intermediate mass black holes. Others think ULXs are regular stellar-mass black

holes that appear to be much more powerful in X-rays because their radiation is beamed in a jet toward Earth.

Chandra's discovery of the persistence and long time period of the X-ray variations -- called quasi-periodic oscillations, because they are not strictly periodic -- of the ULX in M74 is an argument against a beamed jet. These variations are likely produced by changes in a disk of hot gas around the black hole. More massive black holes have larger disks, which in turn are expected to vary over longer periods.

Independent observations of a wide range of black hole X-ray sources with masses ranging from 10 to tens of millions solar masses have revealed a relationship between the time scale of quasi-periodic oscillations and the mass of the underlying black hole. Using this technique, the observed two-hour variation implies that this ULX has a mass of about 10,000 Suns.

NASA's Marshall Center manages the Chandra program for NASA's Science Mission Directorate, Washington.

# Sweat from Marshall team helps test life support system

By Lori Johnston

There's a whole lot of sweating going on in Bldg. 4755.

Marshall Center employees are donating their time, energy – and sweat – during monitored exercise on bikes, rowing machines and treadmills to test part of the life support system that provides the International Space Station with clean air, a comfortable living environment and drinkable water.

The system is called the Regenerative Environmental Control and Life Support System, or ECLSS. The Marshall Center is responsible for designing and developing the Water Recovery System, which reclaims potable water from Space Station wastewater, including crew latent – condensed water vapor and trace contaminants from crew perspiration and respiration – and urine.

The Water Recovery System includes a Urine Processor, designed, assembled and tested in-house at Marshall that recovers water from urine. This resulting “product” is then combined with the crew latent for processing to attain potable quality by the Water Processor Assembly. That assembly, provided to Marshall by Hamilton Sundstrand Space Systems International of Windsor Locks, Conn., cleans wastewater through a series of treatment processes. Those processes primarily include adsorption, which takes the organic contaminants such as caprolactam, which comes from Velcro, out of the water; ion exchange, which takes salt out of the water; and catalytic oxidation, which removes the volatile organics such as methanol and other contaminants that adsorption and ion exchange do not remove.

“The resulting product water is cleaner than municipal water on Earth,” said Layne Carter, lead systems engineer for the Water Processor at Marshall. “On the Station, this water will be used by the crew for everything from drinking to hygiene activities, as well as the operation of payloads.”

To reduce costs and take advantage of Marshall's existing facilities, the qualification test of the Water Processor Assembly treatment process is being performed in the ECLSS Test Facility in Building 4755. The



Photo by Doug Stoffer/ Marshall Center

**Cheryl Kromis of Raytheon participates in testing for part of the Regenerative Environmental Control and Life Support System, or ECLSS. She shows that a little sweat goes a long way for exploration.**

recovered water must meet stringent purity standards before it can be used to support the crew. That's why these tests use the actual chemical “beds,” or expendables, that will process water on the Station. The objective of the tests is to verify the entire assembly works properly. The chemical “beds” are part of the Water Processor Assembly that removes the different types of contaminants from the water so that it can be re-used by the crew as potable water.

More than 100 employees are participating in the Water Processor Assembly Expendables Qualification Test. For the study, they exercise for an hour a day, generating water vapor through perspiration and respiration, in the Regenerative ECLSS Module Simulator – a mockup of a Space Station module filled with treadmills, a bicycle, rowing machine and other exercise equipment. They also brush their teeth, wipe themselves down with wet towels and male participants even shave – simulating the daily routine of a Station crewmember – to get every bit of moisture into the atmosphere.

“It's my chance to get in shape, literally to contribute to science and prove this equipment – that our people at Marshall have worked to design and build – works flawlessly,” said Gray Marsee, a Marshall

attorney who is participating in the tests. “I'm literally donating my sweat to the Space Station and future exploration.”

Before stepping into the mockup for a session, participants are provided a white T-shirt to wear, a towel for drying off and a bottle of water or a sports energy drink to consume as they exercise. They weigh-in on a computerized scale, with the bottle of water in-hand.

“We want to see how much weight goes in and calculate how much condensate is left inside the module,” said Gene Hartsfield, manager of the ECLSS test facility. “The T-shirts and towels are left hanging inside overnight to evaporate to get more sweat out of them and into the condensate.”

Meals also are an important part of the testing. The participants microwave meals inside the module to generate water vapor and the aroma from the food. The condensate is then combined with the Urine Processor product and sent to the water processor for treatment. Water quality samples are taken at key locations in the water processor to assess the performance of the expendables and determine how often they must be replaced.

*The writer, an ASRI employee, supports the Public Affairs Office.*



Photo by Emmett Given/ Marshall Center

**Curtis Manning, left, an engineer in Marshall's Rapid Prototyping Laboratory, describes to Gen. Lance Lord a revolutionary manufacturing technology that produces three dimensional structures directly from computer data.**

## Gen. Lord

*Continued from page 1*

Marshall's expertise in research and development of cutting-edge science and engineering technologies.

"I'm very impressed with the people and the capabilities of the Marshall Center," Lord said. "The Air Force has a great relationship with NASA, and we want to establish closer relationships at the working level, especially in the area of space transportation."

Lord will return to Marshall in a "couple of months," he said -- to strategize with Marshall officials about forming partnerships.

"Gen. Lord's visit underscores the need for NASA and the Air Force to continue our fruitful engagements on all aspects of access to space," said Charles Chitwood, Marshall Center deputy director. "The Vision for Space Exploration and the administration's new National Space Transportation Policy require more intense cooperation, not only in current operations and collaboration, but in future development, especially in the area of heavy lift."

The Vision calls for returning the Space Shuttle to safe flight, completing the International Space Station, returning humans to the Moon and further exploring the Solar System. The National Space Transportation Policy, released in December 2004, was developed through the National Security Space Office and provides a national approach for America's Space Policy.

Lord also was provided an update on the Space Shuttle's return to flight and NASA's Exploration initiative. He was given tours of several Marshall facilities, including the National Center for Advanced Manufacturing, the Automated Rendezvous and Docking facility and the X-ray Calibration Facility.

During his visit, Lord was guest speaker at a dinner March 15 at the Redstone Arsenal Officers Club, co-hosted by the Alabama Coalition for Space Exploration and the Tennessee Valley Air Force Association. The event was attended by Marshall Center leadership, members of the aerospace and defense communities, industry and community leaders.

*The writer, an ASRI employee, supports the Public Affairs Office.*

## Obituaries

*Continued from page 4*

**Katherine Mudd**, 92, of Huntsville, died Feb. 25. Ms. Mudd retired from the Marshall Center in 1974 after working as a records management clerk.

Survivors include a daughter, Martha Carter of Huntsville and one son, Carl Mudd, Jr. of Birmingham.

**Harold Perkins**, 75, Yankeetown, Fla., died Feb. 19. Mr. Perkins retired from the Marshall Center in 1993 as a materials engineer where he worked on the Hubble Space Telescope and various shuttle payloads.

Survivors include three children, Harold Dean Perkins and Dianne Perkins Jacobson of Tallahassee, Fla.; and William Perkins of Winter Garden, Fla.; and a sister Beverly Perkins Jones of Marietta, Ga.

**Gerhard Reisig**, 101, of Huntsville, died March 9. Mr. Reisig retired from the Marshall Center in 1973 after working as an engineer. He was a member of the Wernher von Braun rocket team. He was an avid musician and was co-founder of the Huntsville Chamber Music Guild.

Survivors include two daughters, Gerlinda Talbot of Huntsville, and Dr. Godela Iverson of Moorhead, Minn.

## ***Rocket motor static firing set for Thursday at Center***

The Engineering Directorate at the Marshall Center will conduct a static, or stationary firing, of a scaled-down solid rocket motor for the Space Shuttle's Reusable Solid Rocket Motor Project Office. The 28-second test firing will be performed at 3 p.m. Thursday in the East Test Area.

The test is being conducted to evaluate the performance of six new internal replacement insulation materials in the aft dome, or tail dome, of the motor, and to evaluate the performance of the Intelligent Pressure Transducer, a gauge that samples and records motor pressure. The test motor -- 48-inches in diameter and 27 feet long -- is one-sixth the size of a full-scale Reusable Solid Rocket Motor.

# Payload

*Continued from page 1*

ing 23 astronauts and cosmonauts, totaling more than 4,000 shifts. The team has assisted in the completion of nearly 200 scientific experiments on the Station to date.

Managing all U.S. science assets, as well as figuring out the time and space required to accommodate experiments and programs, makes the job of coordinating Space Station research a critical one. The Payload Operations Center links Earth-bound researchers with their experiments – or payloads — in orbit. The team of flight controllers serves as extra sets of eyes or pairs of hands devoted to science, thus increasing experiment efficiency and saving precious crew time for operations that require a human touch.

The Payload Operations Center is one of three flight control centers around the world that monitor everything that happens aboard the Station. The Huntsville cadre, along with their peers at the Johnson Space Center in Houston and the Russian Mission Control Center in Moscow, work as one team.

When the Payload Operations Center began operation at Marshall, many processes were still being developed, such as working with the astronauts, cosmonauts, the payload developers and scientists around the world. Today, after more than 2,000 on-orbit crew hours, operations are much more routine. In fact, when Expedition 11 launches in April, it will be the first time the teams in Huntsville, Houston and Moscow will work together on an expedition without prior run-throughs, or simulations. "This just goes to show the trust we have built in each other," said Patterson, who will be the Payload Operations manager for Expedition 11.

The payload team has facilitated more than 40 conferences in four years between crews and their researchers on Earth. Another came just a few weeks ago, as Expedition 10 Science Officer Leroy Chiao conducted an experiment on a Saturday. "He wanted to talk to the experiment's principal investigator, and, although it was a weekend, we were able to track down the



Photo by David Higginbotham/ Marshall Center

**Tim Horvath, manager of payload operations for Expedition 10, studies his data.**

scientist at a department store in Cleveland, where we set up a teleconference from the store to the Station," said Tim Horvath, Expedition 10 Payload Operations manager. "There was no end to the number of challenging moments, but it just goes to show how far we will go to accomplish the science mission."

That memory will go down with hundreds of others the team has gathered over the four years – memories such as an astronaut calling from the Station to the cadre just to say thanks for the hard work they were doing, and another astronaut using his "Elvis" voice to communicate with the team from space.

"I also was so impressed with astronauts like Expedition 6 Science Officer Don Pettit who began volunteering his 'free' time on Saturdays to conduct the science experiments we needed to get done," said Patterson. "He was very willing to do whatever we asked and out of that grew a formal 'Saturday Science' that all of our astronauts now participate in."

The team is now planning for the April launch of Expedition 11, as well as the Space Shuttle's Return to Flight, STS-114, scheduled in May. The Payload Operations team has been very busy planning for that mission, as many science experiments and equipment in storage on the Station will be returned to Earth. The crew has spent

nearly 60 hours searching in bags and other storage areas to determine what supplies and equipment have been used in two years, what needs to be re-supplied and what needs to be returned to Earth.

Over the four-year span, nearly 9,000 pounds of NASA payloads and payload hardware has been sent to the Station and more is on the way. The team is preparing for the arrival of new hardware such as the Human Research Facility-2. Human life science researchers will use the on-orbit laboratory to study and evaluate the physiological, behavioral and chemical changes induced by space flight. That unit will arrive on the STS-114 mission.

It will be placed alongside other research racks and facilities on the Station, such as the Microgravity Science Glovebox – a sealed container with built-in gloves for handling experiments with fluids, flames, particles and fumes – and the Human Research Facility Rack, the first on-orbit laboratory dedicated to life sciences.

Space Station scientific research plays a vital role in implementing the Vision for Space Exploration, to return to the Moon and explore our Solar System and every launch is a step into the future.

*The writer, an ASRI employee, supports the Public Affairs Office.*

# Announcements

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## ***Redstone Arsenal Quality Summit is April 12-13***

The Redstone Arsenal 2005 Quality Summit is April 12 and 13 in the Bob Jones Auditorium of the Sparkman Center. The summit's theme is "Incentives for Quality Improvement." Invited speakers include Brian Hughitt, manager of Quality Assurance at NASA Headquarters. On the second day, workgroups will focus on developing ideas and concepts related to the summit theme.

## ***Great Moonbuggy Race runs April 8-9 at U.S. Space & Rocket Center***

High school and college students are working in classrooms, garages and shops all across the country trying to figure out the best way to design, build and race a human-powered buggy capable of traveling around a half-mile track on Earth. Come to the 12th Annual Great Moonbuggy Race on April 8-9 at the U.S. Space & Rocket Center to see their creations.

Seventy-two teams from 20 states, Puerto Rico and Germany will participate. See "Inside Marshall" for more details.

## ***Shuttle Buddies to meet Monday***

The Shuttle Buddies will meet at 9 a.m. Monday at Mullins Restaurant on Andrew Jackson Way. For more information, call Deemer Self at 881-7757.

## ***MARS Skeet and Trap Club leagues to form April 6-7***

MARS Skeet and Trap Club leagues will form April 6 and 7. These informal, recreational leagues are intended to accommodate all skill levels. For more information, call Randy Thornton at 544-1141.

## ***AIAA dinner topic is 'Mars: Rovers Today, Humans Tomorrow'***

The American Institute of Aeronautics and Astronautics will hold a dinner meeting at 7 p.m., April 21 at the Holiday Inn Research Park in Huntsville. Dr. Benton C. Clark, AIAA Distinguished Lecturer and chief scientist of Space Exploration Systems at Lockheed Martin Co., will speak on "Mars: Rovers Today, Humans Tomorrow." The cost is \$15 for students and \$20 for all others. Call Kevin Higdon at 256-679-3143 for reservations by April 20.

## ***Entries being accepted for 2005 Software of the Year Award***

Entries are being accepted for the 12th Annual NASA Software of the Year Award recognizing NASA team members who develop exceptional software for use by NASA. The award includes the NASA Software Medal certificate and up to \$100,000. NASA centers, facilities, major contractors, supporting universities and small businesses may participate. Entry deadline is April 15. For contest rules and submission guidelines, go to <http://icb.nasa.gov/>

## ***Scholarship Ball set for April 14 at Von Braun Center***

The 5th Annual Black-Tie Scholarship Ball will be held at 7 p.m., April 14 at the Von Braun Center North Hall. The event is sponsored by the Alabama A&M University Office of Corporate Relations. Tickets are \$50 and may be purchased from Madeline Hereford of the Marshall Center Equal Opportunity Office.

## ***Mars Ballroom Dance Club spring dance is April 9***

The MARS Ballroom Dance Club spring dinner dance will be April 9 at the Von Braun Center East Hall from 6:30 p.m. to 11 p.m. Dinner will be served at 7 p.m. Tickets are \$20 for MARS Club members and \$25 for all others. Tickets may be purchased until April 5 from MARS Club members, including Linda Kinney at 461-0230 or Hugo Berry at 572-0047.

## ***Advanced Space Propulsion Workshop set for April 7-8***

The 16<sup>th</sup> Annual NASA Advanced Space Propulsion Workshop is set for April 7-8 at the University of Alabama in Huntsville Bevill Center. This year's workshop will focus on technology readiness levels, relatively far-term space propulsion and power concepts and technologies that hold the promise of enabling ambitious robotic and human exploration missions for the 21<sup>st</sup> century. Register for the workshop at <http://www.uah.edu/research/PRC/ASPW>

**Classified Ads**

**Miscellaneous**

Glass door book case, \$50; large oak dining table, 6 chairs, \$575. 256-534-0939

Florida State golf bag w/head covers, putter cover, umbrella, glove, \$50. 883-2065

Kenmore dryer, \$85; Kenmore washer, \$95. 837-6649

Scooter, red, key and pull start, lights, signals, horn, storage basket, never used, \$200. 776-9165

Large formal sofa, \$100; formal chairs, \$25; exercise bike, \$20; Sega Power Rangers game, \$5. 430-6842

Two Nikon 8008S SLR camera bodies w/MF-21 data backs, \$225 each, \$400 both. 256-656-2965

Overstuffed sofa, loveseat & ottoman, white w/other colors, sell separately negotiable, \$900/all. 325-9264

Utility trailer, 5'x8', mesh floor, sturdy frame, tilt, \$325. 256-830-8934

Full-blooded black or white Lab puppies, mom not registered, born Feb. 1, \$50 each. 232-5788

Moving boxes, 50 ea., various sizes, used once, \$50. 256-655-6293

Waterbed, queen-size, dark wood, fully baffled mattress, \$20. 726-2224

Two Alan Jackson concert tickets, April 30, 7:30 p.m., Birmingham, Section D, Row NN, \$148.20. 931-636-2726

Dell computer 800MHz, 512MB memory, 30GB HD, Windows XP, Office 2000, 17" monitor, \$350. 931-703-5956

John Deere SST16 riding lawn mower, 25 hrs. usage, bagger & mulching kit, \$2,500. 214-0110

Magellan GPS companion for Palm M500 Series w/software, \$40. 256-850-4185

Stationary bicycle, \$75; postcards, \$75; antique tabletop knife display case, \$75; DVD player, \$25. 256-881-4067

Gemini KZG 9-degree driver, \$125. 829-1952

Sony laptop, 1.4GHz Centrino, 512MB memory, 60GB HD, wireless, XP, Office, accessories, \$1,000. 256-777-4439

Nikon N80, Nikon 24mm, 50mm, 28-80mm lenses, battery grip, Sunpak PZ5000 flash, case, \$900. 865-567-8862

Above ground pool, 41/2x30, 1-year old, liner & cake steps. 214-2427

Bush Hog, 6', 3 point hitch, new blades, \$250. 256-772-9768

Pennsylvania House video cabinet, Cherry, up to 30" TV, VCR/DVD, \$750. 931-427-2059

1998 Snapper lawn tractor, 14HP, twin blade, 38" cut w/grass catcher, Hydro transmission, \$800. 883-8186

2001 Model Kelty Kids backpack w/rain hood, \$75. 931-703-6935

Camper shell for short S10, \$125; Sunn Model-T guitar amp, \$500; Bach Stradivarius trumpet, \$1,200. 851-8085

Kitchen table, 4 chairs, maple w/white, \$110. 881-9084/Bob

Ray-O-Vac rechargeable alkaline batteries, D size, unopened, \$3 per pack of 2 batteries. 828-6213

Wallpaper, five double rolls, off-white moiré, \$100. 882-2360

White & Caramel lab puppies, \$100 male; \$75 female. 348-5468

Kenmore 24 stitch sewing machine, \$35. 464-9408

Entertainment center cabinet, black finish, 49"Wx58"H, holds up to 36" TV & video and audio components, \$45. 721-7351

Full bedroom suite w/mattress, \$100; coffee/end tables, \$45; washer/dryer, \$100; desk, \$35; printers, \$20. 520-2802/Ron

DR string trimmer, 6HP, electric start, Beaver blade & extra string included, \$275. 828-4564

AKC German Shepherd puppy, champion line, female, 6-months, black/tan, vet checked, shots, \$375. 256-694-5912

851-8447

2000 Toyota Avalon XLS, loaded, \$15,000. 464-9834/Purlee

2003 Nissan Pathfinder, V6, 2WD, automatic, 4-door, 22K miles, leather, CD, tow, silver, \$23,500. 256-880-3337

2001 F150 extended cab, V8, Lariat, loaded, 61K miles, CD, leather, running boards, \$14,995. 534-6155

1997 Jeep Grand Cherokee, 120K miles, 6-cyl., auto transmission, maroon, \$5,500. 797-1220

2003 Neon SE, 4-door, cobalt blue, automatic, new tires, \$8,600. 256-874-4286

1993 Jeep Grand Cherokee Laredo, 4x4, V8, auto, 86K miles, \$4,100. 256-325-0221

1997 BMW 740 IL, 135K miles, dark green, tan leather, loaded, \$12,500. 536-8692

Rare Euro 5-speed Porsche 928 with S4 upgrade & OEM wing. 797-8895

2005 Chevy Equinox LT 2WD, white, leather, 6-CD, tinted windows, V6, 10K miles, one-owner, \$22,500. 652-8383

2003 Silverado, 5.3L, extended cab, towing pkg., bedliner, CD, 18.5K miles, \$19,500. 882-6309

2003 Corvette Z06, 50th Anniversary, Millenium yellow, all options, 13.6K miles, \$38,000. 830-5783

1999 Ford Explorer, 4x4, 75K miles, \$8,299. 353-3229

2001 Tahoe LT, 2WD, blue, 3rd row, leather, towing, rear air/audio, 56K miles, \$18,900. 256-895-6916

2000 Ford Explorer Sport V6, 5-speed, 2WD, AM/FM cassette/CD, 68K miles, one-owner, \$6,500. 256-828-9798

Kawasaki Mojave 4-wheeler, 250cc, kick-start w/reverse, one-owner, \$2,000. 256-586-7013

1999 Buick LeSabre, loaded, \$5,000. 880-1663

**Vehicles**

2003 Chevrolet S-10 ext. cab, 4.3L/V6, automatic, 3-door, red, 39K miles, \$12,500. 256-777-9391

2001 Mustang, 6-cyl., automatic, all-power, CD player, 70K miles, rebuilt title, \$4,500. 256-586-7013

1997 Harley Davidson Road King, carbureted, 23.3K miles, red, hard saddle bags, detachable windshield, \$13,100. 420-2906

2001 Chevrolet 1500HD crewcab, 4x4, 6.0/V8, leather, all options, step rails, Tonneau, \$21,900. 256-498-6568

1996 SeaDoo XP, many extras, will trade for ATV. 256-572-1197

1996 Suzuki King Quad 300, 4x4, ATV, new tires, brush guard, \$1,950. 256-508-9955

1998 Toyota Camry LE, 113K miles, beige/beige, new tires, \$5,500. 539-6932

2000 Harley Davidson XL883 Sportster, 9K miles, extras, Sierra Red Sunglow, \$5,000 firm. 256-350-7805

1993 Nissan Quest, 201K miles, leather, automatic, V6, loaded, transmission problems, \$1,500 negotiable.

**Wanted**

Metal or concrete culvert, approximately 16' to 20', 12-15" diameter. 830-2806

White baby crib and furniture, double stroller w/matching infant car seat, in good condition. 256-830-8934

New unused upgrade for PC Windows 98 operating system, e.g. 98SE, ME 2000 XP. 881-6040

Pottery kiln for clay for home use. 464-3639

Used motorized treadmill. 658-8645

**MARSHALL STAR**

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