



# MARSHALL STAR

Serving the Marshall Space Flight Center Community

Sept. 26, 2002

## NASA TV viewers can hitch a Space Shuttle ride

### External Tank camera to offer unique launch view

by Lynnette Madison

For the first time, Space Shuttle astronauts will carry television viewers along for the initial ride into orbit. NASA Television viewers should see a spectacular live view of the orbiter when Space Shuttle Atlantis lifts off Wednesday.

A color video camera mounted to the top of Atlantis' External Tank will offer a unique perspective as launch occurs. NASA TV plans to provide a live feed from the camera as the shuttle begins its ascent until it reaches near-orbital speed, about 56 miles above the Earth. The camera is expected to provide video for approximately 30 minutes.

The camera, which will provide a view of the front and belly of the orbiter and a portion of the Solid Rocket Boosters and

External Tank, will offer the STS-112 team an opportunity to monitor the shuttle's performance from a new angle.

The camera is mounted to the External Tank's liquid oxygen tank, one of two propellant tanks. The External Tank — the "gas tank" for the Shuttle's three main engines — carries both liquid oxygen and liquid hydrogen in two separate tanks. Often referred to as the backbone of the Shuttle because it provides structural support during launch, the External Tank absorbs the 7.8 million pounds of thrust produced at liftoff by the Shuttle's three Main Engines and the two Reusable Solid Rocket Motors.

Located high on the External Tank liquid-oxygen-tank cable tray, the camera is inside an aluminum fairing covered in protective insulating foam. The battery pack and transmitter are con-

See TV on page 4

## New work tour available Oct. 6

### Maxiflex allows more flexible work schedule

from the Human Resources Department

In support of the Marshall value of encouraging a balance between our personal and professional lives, Marshall managers and the unions have given their full support to making the maxiflex tour available to employees.

This tour is intended to increase employee's flexibilities in completing their basic work requirement of 80 hours per pay period and will be available Oct. 6.

The Marshall Center maxiflex tour consists of three parts — core hours, flexible hours and credit hours.

Core hours are from 9 a.m.-3 p.m., including a 30-minute lunch period, Monday through Friday. These hours are the Marshall Center's core business hours

See *Maxiflex* on page 3



Photo by Emmett Given, NASA/Marshall Center

### **Gen. Lance Lord visits Marshall Center**

Gen. Lance Lord, commander of the U.S. Air Force Space Command at Peterson Air Force Base, Colo., and his wife, Becca, talk to the crew of the International Space Station from Marshall's Payload Operations Center. During his visit Sept. 18-19 to the Marshall Center, Lord met with Center Director Art Stephenson and was briefed on the Space Launch Initiative, Advanced Space Transportation Plan and other programs.

# Winning aerospace design sends students on journey from Capitol Hill to NASA's Marshall Center

by Celeste Atkins

Christopher Broere and Brendan Dwyer are at that “in-between” age.

For most 11-year-olds, that means the time between being a child and becoming a teenager.

For Christopher and Brendan, it means being in the period between speaking to Congress, meeting some of NASA's top officials — including NASA Administrator Sean O'Keefe and Marshall Center Director Art Stephenson — and doing their sixth grade homework.

Christopher and Brendan aren't your average pre-teens from Northport, N.Y. They are winners of NASA's Aerospace Technology Engineering Design Challenge - an educational contest for fifth through eighth grade students across the country. The contest is one of several NASA Student Involvement Programs, which challenge students to develop science and technology skills through group educational projects.

The design project challenged students to create the lightest possible launch platform using only balsa wood sticks and dowels, cardboard and hot glue — while supporting an object many times heavier than the platform itself. To make the challenge really tough, the platform had to survive repeated launches — just like NASA's real launch pads.

Brendan and Christopher's winning design weighed just over an ounce, but was able to launch a “rocket” 70 times heavier. As a result, their entry beat those of dozens of other students from across the United States.

As a reward for their ingenuity, NASA treated the youths to a trip to Washington, D.C., where they demonstrated their winning design to a Congressional space subcommittee. Next, the boys received a trip to U.S. Space Camp at the U.S. Space & Rocket Center in Huntsville, courtesy of NASA, and capped off their tour with a visit to the Marshall Center, showing their



Photo by Doug Stoffer, NASA/Marshall Star

Christopher Broere, left, and Brendan Dwyer, center, meet Marshall Director Art Stephenson during their visit to Huntsville as winners of NASA's Aerospace Technology Engineering Design Challenge.

project to Center Director Stephenson.

“What these young men accomplished is amazing,” Stephenson said. “It's one of the most rewarding things for me to see students grasp highly technical concepts at an early age. Christopher and Brendan have very bright futures ahead of them.”

Bright futures certain to be enhanced by their calm, cool and collected attitudes. When asked if they were nervous presenting their design to Congress, Christopher and Brendan shrugged and shook their heads. Forget nerves. The life-long friends were too excited about their design to suffer from a case of “butterflies.”

“What we learned from this is teamwork,” Brendan said. “After several trial-and-error designs, we combined our best ideas into one — and it worked great!”

Brendan is a sixth-grader at Northport Middle School where his favorite subjects are science and math. Christopher also attends sixth grade at Northport Middle School, but favors science, computers and social studies.

Winning the aerospace design chal-

lenge, Christopher said, gave him an appreciation of NASA's commitment to education.

Both Christopher and Brendan told NASA Administrator O'Keefe of their dream to one day explore outer space.

They just might make that dream come true, too. After all, how many 11-year-olds get to speak to Congress, meet the head of NASA or spend time studying the rocket models in the office of a center director?

Not many. But Christopher and Brendan took it all in stride when asked to sum up their experience as contest winners.

“It was cool!” said Christopher, as Brendan nodded in agreement.

To learn more about educational programs at the Marshall Center, go to <http://education.msfc.nasa.gov/>

*The writer, employed by ASRI, supports the Media Relations Department.*

# James Bilbro named chief technologist at Marshall

from the Human Resources Department

**J**ames "Jim" Bilbro has been named assistant director of technology and chief technologist at the Marshall Center.

Marshall Center Director Art Stephenson made the appointment.

In his new position, Bilbro will focus Marshall's technology development efforts on expanding the frontiers of space to benefit the quality of human life and ensure that Marshall's core technology competencies and technology development activities attain worldwide preeminence.

During his more than 35-year NASA career, Bilbro has established an international reputation as an expert in lightweight optics and coherent laser radar. His many optics accomplishments include formulating the strategy and technology roadmap for developing optics for the Next Generation Space Technology study, establishing the Center of Excellence in optical systems and obtaining a mission



Photo by Emmett Given, NASA/Marshall Center

## Bilbro

area in space optics manufacturing technology. He is credited with conceiving and setting up the world-class Space Optics Manufacturing Technology Center.

As an internationally recognized authority in coherent laser radar, Bilbro created a development program and led the team that demonstrated the first

airborne measurement of wind fields. He also helped develop one of the premier groups in the world in coherent laser radar development, published numerous papers and chaired many conferences on the subject. He is co-holder of a patent for detecting and tracking aircraft wake vortices using coherent laser radars. More recently, Bilbro has concentrated on setting up a group of core technology capabilities.

Bilbro currently serves as the point-of-contact to NASA Headquarters, Office of Space Science, where he is working to establish Core Technology Competencies as an Agency focus.

He earned a bachelor's degree in electrical engineering from Colorado State University in 1969 and a master's in engineering from the University of Alabama in Huntsville in 1977. He also completed course work and residency requirements for masters and doctorate degrees in Optical science at the University of Arizona in 1983.

## Maxiflex

*Continued from page 1*

during which all employees working a maxiflex schedule are expected to be at work or in an appropriate leave status.

Flexible hours are from 6 a.m.-9 a.m. and from 3 p.m.-6 p.m. These are the hours an employee schedules to work, which are outside of the core hours, in order to complete their 80 hours per pay period. Employees may vary their arrival and departure times during these flexible hours based on their established and approved work schedule.

Credit hours are hours an employee working a maxiflex tour may elect to work which are outside of their basic work requirement of 80 hours per pay period. Employees may accrue up to 24 credit hours to use later in the current pay period or in a different pay period. The accrual or use of credit hours requires team leader/supervisory approval and is subject to the availability of meaningful work for the employee to perform.

The maxiflex tour allows employees to create a schedule in which their arrival and departure times may vary each day in accordance with their needs. While the schedule may vary each day, it must still be established and approved in advance. The employee's established schedule may include up to two scheduled off days per pay period and up to 10 hours per day. Credit hours also may be used to extend a day up to 10 hours, but neither an established schedule nor credit hours may be used to extend a day beyond 10 hours. The team leader/supervisor must consider both adequate office coverage and the nature of the

work being performed in determining if a requested schedule is appropriate.

Many people consider credit hours to be the most attractive feature of a maxiflex tour. With approval, credit hours allow employees to extend their workday to complete assignments as necessary. Credit hours may also be earned on weekends or outside of the flexible hours when approved by an employee's team leader/supervisor in advance. Credit hours are distinguished from compensatory time or overtime in that the work is at the request of the employee rather than being ordered by management. Since all employees, other than members of the Senior Executive Service, are eligible to earn compensatory time, credit hours may be a viable option in many situations.

Employees may request to work a maxiflex tour by submitting Marshall Form 4068, MSFC Work Schedule Request, in the pay period prior to when the tour is to be implemented. Information regarding maxiflex tours may be found at <http://hrd.msfc.nasa.gov/leave.html>.

The Human Resources Department and the Payroll Office will host two question and answer sessions for employees to discuss the maxiflex tour. The first will be from 9-10:30 a.m. Oct. 1, in Bldg. 4200, Room P110. The second session will be from 1-2:30 p.m. Oct. 3, in Bldg. 4663 in Room A164.

For more information on the Marshall maxiflex tour, go to [http://hrd.msfc.nasa.gov/maxiflex\\_info.html](http://hrd.msfc.nasa.gov/maxiflex_info.html) or see your organization's human resources specialist.



*Continued from page 1*

tained in an electronics box and mounted in the intertank crossbeam inside the External Tank.

The camera will be turned on fifteen minutes prior to launch and will show the Orbiter and Solid Rocket Boosters on the launch pad. The video will be downlinked from the External Tank during flight to several NASA data-receiving sites and then relayed to the live television broadcast.

The camera is expected to operate for about 15 minutes following liftoff. At liftoff, viewers will see the Shuttle clearing the launch tower and, at two minutes after liftoff, see the right Solid Rocket Booster separate from the External Tank.

When the External Tank separates from Atlantis about eight minutes into the flight, the camera is expected to continue its live feed for about six more minutes. However, NASA may be unable to pick up the camera's signal because the tank may

have moved out of range.

The camera, made by CrossLink, Inc. of Boulder, Colo., is six inches long and resembles a short, thin flashlight. A similar camera has been used by The Boeing Co. for video of Delta rocket liftoffs and by Lockheed Martin Company on Atlas rockets.

Animation and still images from the camera's viewpoint are available at <http://www.nasa.gov/misc/etvvcam.html>.

*The writer, employed by ASRI, supports the Media Relations Department.*

## Ryan Bowerman named recipient of NASA Marshall Center Retirees Association scholarship

*from the MSFC Retirees Association*

**R**yan Bowerman of Moulton has been selected by the University of Alabama in Huntsville to be the recipient of the NASA Marshall Space Flight Center Retirees Association scholarship for 2002.

Bowerman graduated from Lawrence County High School in May 2002 and plans to study chemical engineering at UAH.

While in high school, Bowerman was selected for the National Honor Society in his junior year and became its president during his senior year. He was active in the Student Government Association and was president of his junior class. Other honors he received included being named Boys State Representative, Mr. L C H S and being listed in Who's Who Among American High School Students.

In addition to his academic achievement in high school, Bowerman excelled in football and baseball. In football he made Second Team All Area his junior year and was team captain and named to the All Area Team during his senior year. In baseball he made Honorable Mention All-State his junior year and All-

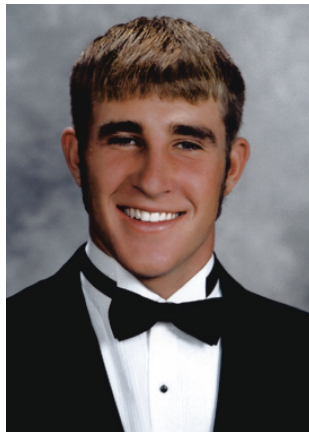
State his senior year. He was a participant in the Lions Club East-West All Star game his senior year. He was named Decatur Daily

Player of the Year and led his team in slugging (.628), batting average (.410), homeruns (6), and Earned Run Average (1.71).

Bowerman also was involved in an array of community work, including various church activities, fund raising to support different causes, support of the elderly, working with youth sports activities, and other areas of community support.

Bowerman has strong connections to the Marshall Center. Both of his maternal grandparents are Marshall retirees. Bowerman's mother, Deborah Simms Bowerman, is a current Marshall employee.

To say that Ryan is "well-rounded" would be an understatement. His record in scholarship and athletics is outstanding and he has a strong sense of obligation to his church and to his community in general. He has established goals for his further development. The Marshall Space Flight Center Retirees Association provides a scholarship of \$1,000 to support the college education of the recipient.



**Bowerman**

### A note of thanks

To my NASA family, civil service and contractors,

"Thank You, Thank You Very Much" (to quote my favorite entertainer – Elvis Presley, of course).

I do so appreciate everything you have done for me over the past few months regarding my recent surgery and recovery period. Your numerous cards,

calls, e-mails, visits, gifts, flowers, food, fruit, thoughts, and concern — but most of all for your prayers. They work better than any medicine. If you could only see the "Thank yous" in my heart, you would know how I feel.

I don't believe I could have made it without my immediate family, my church family, my NASA family, and a host of friends.

I love working for NASA — better people you cannot find. I have had a wonderful 36-year career at Marshall. You are a very great group of professionals and I appreciate you and consider you friends for life.

Thanks again for being there for me. Bennie Jacks, Space Transportation Directorate, Integration Office, Program Support Specialist

# NASA's Next Generation space telescope to be named for space pioneer James E. Webb

NASA Headquarters release

**N**ASA has selected TRW, Redondo Beach, Calif., to build a next-generation successor to the Hubble Space Telescope in honor of the man who led NASA in the early days of the fledgling aerospace agency.

The space-based observatory will be known as the James Webb Space Telescope, named after James E. Webb, NASA's second administrator. While Webb is best known for leading Apollo and a series of lunar exploration programs that landed the first humans on the Moon, he also initiated a vigorous space science program, responsible for more than 75 launches during his tenure, including America's first interplanetary explorers.

"It is fitting that Hubble's successor be named in honor of James Webb. Thanks to his efforts, we got our first glimpses at the dramatic landscapes of outer space," said NASA Administrator Sean O'Keefe. "He took our nation on its first voyages of exploration, turning our imagination into reality. Indeed, he laid the foundations at NASA for one of the most successful periods of astronomical discovery. As a result, we're rewriting the textbooks today with the help of the Hubble Space Telescope, the Chandra X-ray Observatory and, in 2010, the James Webb Telescope."

The James Webb Space Telescope is scheduled for launch in 2010 aboard an expendable launch vehicle. It will take about three months for the spacecraft to reach its destination, an orbit 940,000 miles in space, called the second Lagrange Point or L2, where the spacecraft is balanced between the gravity of the Sun and the Earth.

Unlike Hubble, Space Shuttle astronauts will not service the James Webb Space Telescope because it will be too far away.

The most important advantage of this L2 orbit is that a single-sided sun shield on only one side of the observatory can protect Webb from the light and heat of both the Sun and Earth. As a result, the observatory can be cooled to very low temperatures without the use of complicated refrigeration equipment. These low temperatures are required to prevent the Webb's own heat radiation from exceeding the brightness of the distant cool astronomical objects.

Before and during launch, the mirror will be folded up. Once the telescope is placed in its orbit, ground controllers will send a message telling the telescope to unfold its high-tech mirror petals.

To see into the depths of space, the James Webb Space Telescope is currently planned to carry instruments that are sensitive to the infrared wavelengths of the electromagnetic spectrum. The new telescope will carry a near-infrared camera, a multi-object spectrometer and a mid-infrared camera/spectrometer.

The James Webb Space Telescope will be able to look deeper into the universe than Hubble because of the increased light-collecting power of its larger mirror and the extraordinary sensitivity of its instruments to infrared light. Webb's primary mirror will be at least 20 feet in diameter, providing much more light gathering capability than Hubble's eight-foot primary mirror.

The telescope's infrared capabilities are required to help astronomers understand how galaxies first emerged out of the darkness that followed the rapid

expansion and cooling of the universe just a few hundred million years after the big bang. The light from the youngest galaxies is seen in the infrared due to the universe's expansion.

Looking closer to home, the James Webb Space Telescope will probe the formation of planets in disks around young stars, and study supermassive black holes in other galaxies.

Under the terms of the contract, valued at \$824.8 million, TRW will design and fabricate the observatory's primary mirror and spacecraft. TRW also will be responsible for integrating the science instrument module into the spacecraft as well as performing the pre-flight testing and on-orbit checkout of the observatory.

The Goddard Space Flight Center, Greenbelt, Md., manages the James Webb Space Telescope for the Office of Space Science at NASA Headquarters in Washington. The program has a number of industry, academic and government partners, as well as the European Space Agency and the Canadian Space Agency.

More information on James Webb Space Telescope is available at: <http://www.ngst.nasa.gov>



Webb

Marshall Imaging Services

# National Hispanic Heritage Month proclamation

National Hispanic Heritage Month, 2002  
By the President of the United States of America  
A Proclamation

America's cultural diversity has always been a great strength of our Nation. The Hispanic-American community has a long and important history of commitment to our Nation's core values, and the contributions of this community have helped make our country great. During National Hispanic Heritage Month, we celebrate the many achievements of Hispanic Americans and recognize their contributions to our country.

In 1968, the Congress authorized President Lyndon Johnson to proclaim National Hispanic Heritage Week, and this observance was expanded in 1988 to a month-long celebration to honor our Nation's Hispanic heritage.

During this month, America celebrates the traditions, ancestry, and unique experiences of those who trace their roots to Spain, Mexico, the countries of Central and South America, and the Caribbean.

Throughout our history, Hispanic Americans have enriched the American way of life, and we recognize the millions of Hispanic Americans whose love of family, hard work, and community have helped unite us as a people and sustain us as a Nation. As entrepreneurs and public servants, scholars and artists, Hispanic Americans have provided wisdom, energy, and leadership to our communities, and to our country. During the Civil War, David Glasgow Farragut, son of Revolutionary War hero Jorge Farragut of Spain, won fame as a Union hero by blocking Southern ports. The Congress rewarded his valor by naming him the Navy's first four-star Admiral. Today, a statue honoring his many accomplishments stands in Farragut Square.

Washington, D.C. Nearly a century ago, Hispanic actresses Myrtle Gonzalez and Beatriz Michelena were popular stars in silent films. Many others followed as the industry expanded in the 20th Century, including Rita Hayworth, Fernando Lamas, and Anthony Quinn. In 1959, Dr. Severo Ochoa was a co-recipient of the Nobel Prize in Physiology or Medicine for the discovery of RNA (ribonucleic acid), one of the chemical building blocks of life. In the world of sports, athletes such as Roberto Clemente earned the admiration of countless Americans for his athletic skill and commitment to humanitarian efforts.

We also remember those Hispanics who established the vibrant and diverse American cities of Los Angeles, San Francisco, Santa Fe, San Antonio, and many others. We remember those who were instrumental in exploring and mapping our great hemisphere and we honor those proud Hispanic-American patriots who fought and died for our country in every war and conflict since our founding.

During National Hispanic Heritage Month, I join with all Americans in celebrating this rich and diverse culture and encourage all citizens to recognize the important role of Hispanics in creating and building this great Nation.

To honor the achievements of Hispanic Americans, the Congress, by Public Law 100-402, has authorized and requested the President to issue annually a proclamation designating September 15 through October 15, as "National Hispanic Heritage Month."

NOW, THEREFORE, I, GEORGE W. BUSH, President of the United States of America, do hereby proclaim September 15 through October 15, 2002, as National Hispanic Heritage Month. I call upon public officials, educators, librarians, and all the people of the United States to observe this month with appropriate ceremonies, activities, and programs.

IN WITNESS WHEREOF, I have hereunto set my hand this thirteenth day of September, in the year of our Lord two thousand two, and of the Independence of the United States of America the two hundred and twenty-seventh.

GEORGE W. BUSH

## Hispanic Youth Conference set Oct. 11-12

**O**n Oct. 11-12, the Marshall Center, through Stillman College in Tuscaloosa, will sponsor the first Hispanic Youth Conference in Huntsville to motivate Alabama's Hispanic high school students to continue their education and inspire their interest in attending college. The event will be at the Marriott Hotel in Huntsville.

This conference will be an opportunity for Hispanic high school students to receive recognition and support from the

community.

During the event, students will meet elected state leaders, business professionals, and NASA scientists, engineers and astronauts.

For additional information, contact Hispanic Outreach/Latinos Adelante (HOLA), Yolanda Martinez, president at (256) 527-9537 or e-mail [Ymartinez@adph.state.al.us](mailto:Ymartinez@adph.state.al.us)



# Marshall 'fiesta' celebrates Hispanic Heritage Month

The Marshall Center kicked off its Hispanic Heritage Month celebration Sept. 16 with a "Fiesta in the Courtyard" behind Bldg. 4200.

Mexican food, live music and dancing were the attractions. Performing were "The Latin Rhythms Band" along with special guest guitarist and vocalist Jose Cordereo. Charlie's Grill provided the Mexican meals.



Jose Matienzo sings as "The Latin Rhythms Band" belts out a tune.



Jose Cordero strums through a song.



Alicia Beam and Jim Bilbro enjoy a dance.



Jose Sanchez and Bernie Kennedy get into the swing of things.



Charlie Anderton of "Charlie's Grill" pours on the salsa for Jerry Williams.

Photos by Emmett Given, NASA/Marshall Center

# Space movie reveals shocking secrets of the crab pulsar

Marshall news release

Just when it seemed like the summer movie season had ended, two of NASA's great observatories have produced their own action movie.

Multiple observations made over several months with NASA's Chandra X-ray Observatory and the Hubble Space Telescope captured the spectacle of matter and antimatter propelled to near the speed of light by the Crab pulsar, a rapidly rotating neutron star the size of Manhattan.

"Through this movie, the Crab Nebula has come to life," said Jeff Hester of Arizona State University in Tempe, lead author of a paper in the Sept. 20 issue of *The Astrophysical Journal Letters*. "We can see how this awesome cosmic generator actually works.

The Crab was first observed by Chinese astronomers in 1054 A.D. and has since become one of the most studied objects in the sky. By combining the power of both Chandra and Hubble, the movie reveals features never seen in still images. By understanding the Crab, astronomers hope to unlock the secrets of how similar objects across the universe are powered

Bright wisps can be seen moving outward at half the speed of light to form an expanding ring that is visible in both X-ray and optical images.

These wisps appear to originate from a shock wave that shows up as an inner X-ray ring. This ring consists of about two-



Photo by Dennis Olive, NASA/Marshall Center

## Working under Old Glory

Allen Chandler, left, and Mike Mills, right, both EG&G employees, are recaulking windows on Bldg. 4200. The work on the northside of the building has been progressing for several weeks. Marshall team members should use alternate entrances and exits during this time.

dozen knots that form, brighten and fade, jitter around, and occasionally undergo outbursts that give rise to expanding clouds of particles, but remain in roughly the same location.

"These data leave little doubt that the inner X-ray ring is the location of the shock wave that turns the high-speed wind from the pulsar into extremely energetic particles," said Koji Mori of Penn State University in University Park, a coauthor of the paper.

Another dramatic feature of the movie is a turbulent jet that lies perpendicular to the inner and outer rings. Violent internal motions are obvious, as is a slow motion outward into the surrounding nebula of particles and magnetic field.

"The jet looks like steam from a high pressure boiler," said David Burrows of

Penn State, another coauthor of the paper. "Except when you realize you are looking at a stream of matter and anti-matter electrons moving at half the speed of light!"

The inner region of the Crab Nebula around the pulsar was observed with Hubble on 24 occasions between August 2000 and April 2001 at 11-day intervals, and with Chandra on eight occasions between November 2000 and April 2001. The Crab was observed with Chandra's Advanced CCD Imaging Spectrometer and Hubble's Wide-Field Planetary Camera.

Images and additional information about this result are available at <http://chandra.harvard.edu/> and <http://chandra.nasa.gov/>

# NASA-built atomic clock does the time warp

JPL news release

A 1970s song by the late singer Jim Croce begins, "If I could save time in a bottle ...". And when it comes to atomic clocks – those ultra-precise standard-keepers to which other precision timekeeping devices are set – some do just that. Atoms of an element are often held in a glass vacuum chamber whose walls are coated to prevent the atoms' collision with the walls from altering their internal compositions. Inevitably, such collisions still distort the

atoms and make them 'tick' differently, causing the clocks to run fast or slow.

Now a team of physicists and engineers at NASA's Jet Propulsion Laboratory, Pasadena, Calif., has developed an improved way to release the time genie from its bottle, so to speak. Building upon more than a decade of work on a frequency standard called the linear ion trap, the JPL Frequency Standards Laboratory team has developed and installed a new, trapped ion

See *Clock* on page 10



## KSC team rescues distressed diver

Kennedy Space Center news release

**A** Kennedy Space Center team helped rescue a diver in distress on Sept. 11, using a recompression chamber on board Freedom Star, one of the Shuttle Rocket Booster retrieval ships, manned by United Space Alliance workers.

The diver, Jack Wilcox, 50, is in good condition and recovering in Florida Hospital Orlando after being airlifted from the Army dock at Port Canaveral, Fla. It is believed he suffered decompression sickness after ascending too quickly in an out-of-air emergency.

"I don't know what would have happened if they hadn't happened to be out there," Wilcox said from his hospital bed a day after the rescue. "Andy Fish (a USA SRB retrieval diver and diver medical technician) stayed with me inside the chamber the whole time working with me and reassuring me. The KSC folks were really great throughout the whole experience."

Wilcox and several friends were lobster diving in 100 feet of water about 20 miles off of Cape Canaveral, when Wilcox ran out of air. He approached his dive buddy and shared air to about 60 feet. Having difficulty getting enough air, Wilcox made a free ascent to the surface.

Wilcox experienced chest pain and difficulty breathing as the boat, Knot Content, headed into port. The group radioed the U.S. Coast Guard for help.

The Freedom Star team, who are a part of USA's SRB Element

Marine Operations, heard the call for help and asked the Coast Guard if they could assist. The ship was out on a crane certification exercise and coincidentally had a diver medical technician and other divers training on the crane. The ship's divers were trained for the hyperbaric chamber on board.

"We only did what anyone would do," said Capt. Dave Fraine,

"It's the law of the sea. You help when you can. We're just grateful to God we were able to help."

Jack Mullen, the USA retrieval supervisor aboard Freedom Star, said the diver DMT and team were able to help because of all the training they do to be able to assist one of their own in case of a dive accident during a retrieval mission. The hyperbaric chamber on board is used to help a diver suffering decompression sickness – too many nitrogen bubbles in the blood – which can



Photo by Doug Stoffer, NASA/Marshall Center

### Flow liner success celebration

Marshall team members celebrate their part in finding the cause and repairing flow liner cracks that grounded the Space Shuttle fleet this summer. The 211 civil servants and contractors gathered at The Roundhouse in Huntsville recently where they received certificates of appreciation for their work and were treated to lunch courtesy of Marshall's Shuttle Project, Engineering Directorate and Transportation Directorate managers. Teams of material, structural and cryogenic propulsion engineers from across the U.S. Shuttle Program worked non-stop to return the Shuttle to flight. Shuttle Atlantis is scheduled to launch between 1-4 p.m. CDT on Oct. 2 on the STS-112 mission to the International Space Station.

cause injury or death if untreated.

"We are glad our training and capabilities could be of assistance to a member of the public. It was just by luck that we were in the middle of a training operation and were close enough with the right resources to be able to help," Mullen said.

Capt. Fraine, Mullen and their Freedom Star team scrambled to meet the Knot Content after the Coast Guard gave them the go ahead.

"The KSC folks were all lined up on board to grab me,"

Wilcox said. "Within a few seconds they had me in the chamber and Andy began to work with me taking my vital signs and doing what he could do to help me."

Kennedy's Occupational Health doctor, Skip Beeler, met the team, along with USA diver medical technicians, KSC firefighters and paramedics, to help with the chamber at the Army dock. The doctor entered the chamber and continued the process of helping to stabilize Wilcox. After several hours in the chamber, Wilcox, who lives in Orlando, Fla., was airlifted to Florida Hospital Orlando.

"I didn't know if I was going to make it. It's a huge relief to be in the hospital recovering thanks to the KSC guys," Wilcox said.

### Obituaries

**Walls, Georgia L., 84**, of Jackson, Tenn., died May 15. She retired from the Marshall Center in 1967 as a personnel resources specialist.



Photos by Doug Stoffer, NASA/Marshall Center

### Marshall exhibits at AMPET Conference

The fifth Aerospace Materials, Processes and Environmental Technology Conference Sept. 16-18 featured the new Shuttle Launch Experience exhibits at the Von Braun Center in Huntsville. The exhibits illustrate Marshall's role in managing the propulsion elements - - Solid Rocket Boosters, External Tank and the Main Engines -- that take the Shuttle into orbit. Each year, the conference provides a forum for manufacturing, environmental, materials, and processes engineers, scientists and managers to describe, review and critically assess advances in key technology areas.

## Clock

*Continued from page 8*

atomic clock for the U.S. Naval Observatory in Washington that essentially eliminates these walls. These innovations are expected to provide 20 times improved stability over previous trapped ion clocks. The result is a clock that's effective stability is equivalent to about one minute in 10 billion years.

The instrument, based on mercury ions, will be measured with a large ensemble of atomic clocks operated to form a very stable, continuous timescale at the Naval Observatory, which serves as the center of all U.S. Department of Defense timekeeping and supports the needs of the Global Positioning System, or GPS. During this evaluation, the ion clock will also be used as a frequency reference for transcontinental time and frequency transfer comparisons to be performed between the Observatory and the only other ion clock of its kind, located at JPL.

"These trapped ion atomic clocks are designed for long-term stability, continuous operation and high reliability," said Dr. Robert Tjoelker, supervisor of JPL's Frequency and Timing Advanced Instrumentation Development Group.

In the linear ion trap frequency standard, mercury ions—atoms with an electron removed – collide not with a wall but with an applied electric force field. The field completely surrounds the ions, forming a container called an ion trap.

Because the mercury ions have a positive charge, they can be held with oscillating electric fields in a container produced with metallic electrodes inside an ultra-high vacuum system, and made into a clock.

Like all clocks, atomic clocks measure the frequency of a recurring event to keep time. A wonder of quantum mechanics that govern the world of atoms is that every isolated atom in the universe is exactly the same as every other atom of the same

element and containing the same number of neutrons. Atomic clocks have unique measurement capability because every atom or ion in the clock is quantum-mechanically identical to every other one. By measuring the transition of atoms as they move back and forth between two energy levels, atomic clocks provide an absolute reference for frequency and time. Their success is such that time and frequency are today measured with far higher accuracy than any other physical quantity.

One use of the time scale maintained at the U.S. Naval Observatory is to monitor onboard GPS space clocks and reset them periodically to keep the GPS radio navigation system working well. These onboard clocks aren't as accurate as the ground clock ensemble maintained at the Observatory.

NASA uses atomic clocks to provide reliable and consistent navigation for interplanetary space travel, where fractional disparities in clock tick rates can dramatically affect the navigation of spacecraft. Trapped ion clock technology currently operates in NASA's Deep Space Network and is also being developed for small, low-mass and low-power space flight applications.

The Naval Observatory's mission includes determining positions and motions of the Earth, Sun, Moon, planets, stars and other celestial objects, providing astronomical data; determining precise time; measuring Earth's rotation; and maintaining the Master Clock for the U.S. Department of Defense. Observatory astronomers formulate the theories and conduct the relevant research necessary to improve these mission goals. This astronomical and timing data, essential for accurate navigation and support of communications on Earth and in space, is vital to the Navy and Department of Defense and is used extensively by other government agencies and the public.

# Center Announcements

## Marshall Continual Learning broadcasts conclude Oct. 1

The broadcasting of Marshall Continual Learning Channels 13 and 14 ends Oct. 1. All training materials will continue to be available at the Self-Study Learning Center, Bldg. 4200, Room G-13. For more information, call 544-8291 or e-mail [self.study@msfc.nasa.gov](mailto:self.study@msfc.nasa.gov)

## Chemical inventory training

Mandatory training will be conducted for all civil service and contractor personnel involved in preparation of chemical inventories from 9 a.m.-10 a.m. Oct. 2, Bldg. 4200, Morris Auditorium. Registration begins at 8:30 a.m. For more information, call David Glover at 544-4772. Inventory reprints can be picked up at the training session or afterward at Bldg. 4249, Room 103.

## Ballroom dance lessons available

MARS Ballroom Dance Club lessons are held each Monday in September. Cost is \$7 per person. Intermediate lessons are from 7 p.m.-8 p.m. with beginner lessons from 8 p.m.-9 p.m. at St. Stephens Episcopal Church on Whitesburg Drive in Huntsville. For information, call Woody Bombara at 650-0200.

## Big Spring Jam tickets on sale

The NASA Exchange Space Shop in Bldg. 4203 is offering Marshall team members reduced rates on weekend passes to the Sept. 27-29 Big Springs Jam in Huntsville. Price for the three-day event ticket is \$25 -- \$5 off of the regular price. Children age 11 and under are admitted free when accompanied by an adult. Tickets are on sale until Thursday. For more information, call Candy Bailey at 544-7565 or Bill Mayo at 544-7564.

## CFC Community Service Days activities open

Volunteers can sign up to work with the Salvation Army and United Cerebral Palsy during CFC Community Service Days. For more information, go to <http://ntf-2.msfc.nasa.gov/cfc2002.nsf/csd>.

## AUTOTESTCON conference begins Oct. 15

The Institute of Electrical and Electronics Engineers is sponsoring AUTOTESTCON 2002 -- an international conference that for 37 years has gathered the military/aerospace automatic test industry together to share new technologies, discuss innovative applications and exhibit products and services. This year's event is Oct. 15-17 in the South Hall of the Von Braun Center. Admission on Oct. 16 is free to anyone with a Marshall Center or Redstone Arsenal badge. For more information, go to <http://autotestcon.com/2002/2002.htm>.

## Training schedule changed

The training course "Introduction to Contract Administration" has been changed to 1-4:30 p.m., Oct. 17, Bldg. 4200, Room G-13E.

## Space Shop closed for inventory

The Space Shop in Bldg. 4203 will be closed for inventory Friday and Monday.

## Disposal Operations sale is Oct. 8

A drop-by spot bid sale will be from 9 a.m.-2 p.m. Oct. 8 at Intergraph Building 21, 470 Dunlop Blvd., Huntsville. Disposal Operations at the Marshall Center is conducting the sale, which will consist of 12 IBM compatible desktop computer systems, five monitors, two shipping containers and 32 lots of assorted furniture including chairs, desks, computer tables, bookcases, file cabinets, podium, examining chair and storage cabinets. For more information, call 544-4667, Greg Tate at 544-1774 or go to <http://www.gsauctions.gov>.

## Space Society event features Konrad Dannenberg

Konrad Dannenberg, a propulsion engineer for Dr. Wernher von Braun's A-4/V2 rocket team, will speak from 7-8:30 p.m. Oct. 3 at the Huntsville-Madison County Public Library. His topic will be "60th Anniversary of the A-4: The

First Rocket to Reach Space." The event is sponsored by the local chapter of the National Space Society and is open to the public. There is no admission charge. For more information, call Ronnie Lajoie at 721-1083 or e-mail [HAL5@hiwaay.net](mailto:HAL5@hiwaay.net).

## Travel document updates available

The Travel Office at Marshall has received numerous calls from preparers saying that they are being instructed to enter all travel through Oct. 21. This is incorrect. Authorizations for travel beginning in fiscal year 2002 should already have been completed. Do not enter any authorizations for travel beginning in fiscal year 2003 until you have received the new travel URL, which is expected Monday. Documents entered under the old URL will not move to the new URL. Last payment of vouchers was Wednesday and will not resume until sometime after Oct. 21. For more information, call 544-7312.

## 2002 physical inventory set Oct. 1

A 100-percent physical inventory of controlled equipment at the Marshall Center will begin Oct. 1. All controlled equipment should be made available when inventory teams arrive in your department. For a schedule of assigned scanning times, go to <http://inv2002.msfc.nasa.gov>.

## Procurement retirees meet Oct. 1

Procurement Office retirees will meet for breakfast at 9:30 a.m. Oct. 1 at Mullins Restaurant on Andrew Jackson Way in Huntsville. For more information, call Carl Melton at 837-5604.

## FIRST Robotics Competition volunteers needed

The Marshall Center's Education Programs Department is requesting volunteers to work with local and area schools involved in the For Inspiration and Recognition of Science and Math Robotics Competition. A meeting for volunteers is at 10:30 a.m. on Oct. 8. For more information, call Beth Ingram at 544-0774 or visit <http://www.usfirst.org>.



# Employee Ads

## Miscellaneous

- ★ Lionel diesel engine with /calf unit, Union Pacific \$120. Old Lionel train set w/box \$150. 306-0700
- ★ Baby Trend stroller for two, front seat younger child, rear seat older child, \$50. 256-734-4643
- ★ Waterford crystal chandelier, six light, two large hand-woven Turkish carpets, southwestern colors. 256-882-6832
- ★ Nordic Flex gold power meter, butterfly, pull strap, manual, video, \$400. 837-6797
- ★ Solid Cherry formal dining room set, two captain chairs, six regular chairs, \$1,950. 656-2965
- ★ 1985 Holiday Rambler Imperial RV trailer, 32', \$5,000. 837-4491
- ★ iMac Indigo, Lexmark Z23 printer and UMAX Astro scanner, \$500. 656-5552
- ★ Basset Cherry crib w/mattress & matching Cherry changing table, \$350. 830-4522
- ★ High chair, \$20; diaper Genie, \$10; car seat, \$20; changing table, \$5; carrier, \$5. 852-2145
- ★ Bach Stradivarius trumpet, \$1,300; Dremel scroll saw, \$60; Apple Quadra 605, make offer. 851-8085
- ★ Helmet, Shoei VFX-R off-road, size large, black/green, new in box, \$235. 256-353-7224
- ★ Custom baby bedding, complete set Waverly pastel plaid w/3-window treatments, \$300 obo. 837-5380
- ★ Boy/Men's bedroom suite, dark finish, full headboard, footboard, metal rails, dresser/mirror, chest, \$450. 256-498-6568
- ★ Bedroom suite, Cherry finish, poster bed, dresser, chest, \$2,000. 256-233-8595/961-1605
- ★ Exercise machine, Voit Gravity Rider, no cables, weights or rubber bands, \$30. 772-7367
- ★ Wooden student desk, 38"x24"x31" high, 3-storage drawers, pencil drawer, \$40. 837-0656
- ★ Heavy solid wood single bed w/drawers and cabinet below, \$150. 837-0656
- ★ Bose 901 speakers, oak finish, pre-amp, stands, \$1,000 obo. 922-1424
- ★ Yamaha YSL682G professional tenor trombone with F, large bore, 3 yrs. old, \$1,100. 772-7367
- ★ 1983 Chevrolet, 1984 Camero/Firebird, 1989 Continental, 1997 Explorer/Mountaineer shop manuals. 881-0457
- ★ Wedgewood blue w/revealed pewter lining window treatments w/silver-leaf wooden roads,

- 3 windows. 882-1097
- ★ Hydramax above ground pool pump, 40 GPM, used one season. 721-7812
- ★ Kenwood component stereo system, receiver, CD player, dual cassette deck, equalizer, speakers, cabinet, \$400. 325-7542
- ★ Mink stole, \$600; metal desk, ex-gov't style, 3'x6', light colored top, 5-drawers, \$20. 971-0499
- ★ Sofa and matching loveseat, \$125. 256-881-8374
- ★ Lifetime slam/dunk adjustable basketball goal, \$30. 256-881-6909
- ★ Dresser, 5-drawer, \$60; race car waterbed, \$100. 604-8730/lv. msg.
- ★ Loveseat, blue, \$100; bookshelf, \$5; all-wood computer desk w/3 drawers, \$35; other items. 955-7159/683-0717 cell
- ★ Yamaha Clavinova, 88 weighted keys, two pedals, MIDI, \$1,200; NordicTrack Ellipse 910E exerciser, \$125. 830-9464

## Vehicles

- ★ 1995 Olds Cutlass Supreme, 4-door, auto, new tires/brake pads on front, 73K miles, \$6,500. 256-725-4403
- ★ 1975 Corvette Coupe, red, T-tops, low mileage, \$7,750. 256-423-7231
- ★ 1999 Chevy Camaro, teal, new tires, loaded, below NADA. 256-656-5552
- ★ 1994 Corvette, white, auto, power seats, traction/climate control, 154K miles, \$13,000. 325-6885
- ★ 1996 C-1500 GMC Sierra, ext. cab, V8, auto, bedliner, camper shell, keyless entry, \$10,500. 256-837-2223
- ★ 1992 Nissan King-cab pickup, red, 4x4, 5-speed, a/c, 83K miles, \$6,500 obo. 489-8421
- ★ 1992 Dodge Dynasty, 4-door, 6 cyl., all-power, new tires & battery, \$1,875. 881-7198
- ★ 1988 Chevrolet 1500 truck, SWB, 4x4, low mileage, V8, auto, a/c, \$4,000. 722-0417
- ★ 1993 Ford Taurus., 105K miles, all power, \$1,800.
- ★ 1995 VW Golf, new tires, brakes, alternator, battery, 92K miles, \$4,500 obo. 536-5971
- ★ 1993 Silverado Z71, 4x4, Club-cab, utility pkg., all-power, tinted windows, toolbox. 256-586-7297 lv. msg.
- ★ 2000 Ford Windstar SE, CD player, console, captains seats, 46K miles, light blue, \$17,000. 773-1211
- ★ 1999 Lexus LX470 Luxury SUV, 55K miles, tow package, seats eight, heated leather, moonroof. 350-2901

- ★ 1993 Ford Taurus, 105K miles, all-power, \$1,750. 230-6819
- ★ 1997 Ford F150 XLT, ext. cab, third door, V8, 5-speed, 4.6L, black w/gray interior. 509-2654
- ★ 1989 Buick LaSabre, one-owner, \$1,200. 464-9965
- ★ 1994 Jeep Grand Cherokee Limited, loaded, V8, one-owner, towing pkg., \$8,500 obo. 971-1511
- ★ 1991 Mazda 929, 141K miles, leather, CD, cassette, \$3,000. 351-7804
- ★ 1997 Jeep Wrangler Sport, 6-cyl., 5-speed, 4x4, 79K miles, a/c, dark green w/tan soft-top, \$10,800. 882-7350
- ★ 1979 Mercedes 450SL, 80K original miles, both tops, black w/tan interior, \$11,900. 837-5862
- ★ Motor-home, Class A, Boise 1972, Wedge engine, 32K miles, \$5,000; 1980 Datsun 200SX, 5-speed, hatchback, \$1,500. 881-9150
- ★ 1995 Pontiac GrandAm SE, red, V6, automatic, a/c, cruise, \$3,500. 256-726-8686
- ★ 1999 Dodge 2500, 4x4, SLT diesel, ext. cab, am/fm/CD, 5-speed, 96K miles, \$19,500. 931-732-4742

## Wanted

- ★ Boys twin bunk bed bedroom set; color computer monitor. 722-5545 after 6 p.m.
- ★ Used swing set in good condition. 564-7534

## Free

- ★ Concrete slab, all sizes, for landscaping, fill, or erosion control. 880-6335/Keith
- ★ Child's rock collection. 881-0457

## Found

- ★ Ballpoint pen in Bldg. 4203 cafeteria on Sept. 18. Call 544-7714 to identify/claim
- ★ Cell phone accessory found in Bldg. 4200 Lobby. Call 544-3623 to claim/identify
- ★ Woman's watch in Bldg. 4203 parking lot. Call 544-8354 to claim/identify
- ★ Pair of eyeglasses in Men's Room, second floor, Bldg. 4732. Call 544-0963 to claim/identify

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