

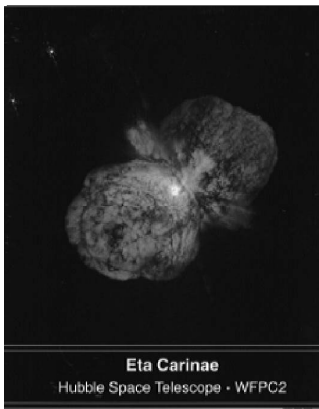


Mission: STS-79 on Atlantis.

Launch date, time: July 31, approximately 11:42 p.m. from Launch Pad 39A.

Mission Synopsis: STS-79 is the fourth in a series of NASA docking missions to the Russian Mir Space Station, leading to the construction and operation of the International Space Station. As the first flight of the Spacehab Double Module, STS-79 encompasses research, test and evaluation of ISS as well as logistics resupply for the Mir Space Station. STS-79 is also the first NASA/Mir American crew member exchange, with astronaut John Blaha replacing Shannon Lucid aboard the Mir.

Landing date, time: August 9 at approximately 8:17 p.m. at KSC.



Eta Carinae
Hubble Space Telescope - WFPC2

A HUGE, billowing pair of gas and dust clouds are captured in this Hubble Space Telescope (HST) image of one of the most massive stars in our galaxy, the supermassive Eta Carinae. Eta Carinae, located more than 8,000 light years away, was the site of a giant outburst about 150 years ago, when it became one of the brightest stars in the southern sky. The exploding star is radiating about five million times more power than the Sun.

Spaceport News

America's gateway to the universe. Leading the world in preparing and launching missions to Earth and beyond.

John F. Kennedy Space Center

Olympic spirit runs through KSC

Not only is the international symbol for the Olympics coming to KSC this summer, but KSC will have a presence at the Olympics. The Olympic spirit will begin to be felt on center July 7 when the Olympic torch passes through as it continues on its circuitous route from Los Angeles to Atlanta.

Seventeen KSC employees have been selected by the Atlanta Committee for the Olympic Games as torch bearers and, beginning about 2 p.m., will carry the flame along the crawlerway, up the Pad A ramp

and back down. The torch will then be transferred by vehicle to State Road 3 and the NASA Parkway. From there runners will then carry the flame to the KSC Visitors Center where a public ceremony will be held.

Although employees may invite family and friends to view the event along the crawlerway, parking will be limited and available on a first-come, first-

served basis. Each vehicle entering the area must have a badged employee or a placard which are available only for employees who will be working that day. Employees are encouraged to watch from the Visitors Center where all of the KSC torch bearers will be publicly recognized.

At press time STS-78 is scheduled to touch down at the Shuttle Landing Facility at 8:51 a.m. that day. If that occurs, Commander Tom Henricks, Pilot Kevin Kregel and Mission Spe-

(See OLYMPICS, Page 5)

STS-78 could provide world with new view

By Chuck Weirauch

When the Space Shuttle Columbia lifts off from Launch Pad 39B with the Life and Microgravity Spacelab (LMS) mounted in its payload bay to begin the STS-78 mission (scheduled at press time for 10:49 a.m. June 20), it could be the start of the longest Shuttle flight to date. Although the flight plan is for a 15-day, 22-hour mission, careful management of electrical power consumption on board the orbiter could allow an extra day for science work. The decision to extend the flight by Mission Control at Johnson Space Center would enter STS-78 into the history books with a 16-day, 22-hour record space flight.

Another first for this mission is the first use of cameras on the flight deck to provide a near-real-time television video of the crew entering the crew cabin and getting ready for flight, a recorded view of astronauts



THE STS-78 flight crew poses for a group portrait next to the Space Shuttle Columbia at Launch Pad 39B. From the left are Mission Specialist Charles Brady, Pilot Kevin Kregel, Payload Specialist Jean-Jacques Favier, Payload Commander Susan Helms, Mission Commander Terrence "Tom" Henricks, Payload Specialist Robert "Bob" Brent Thirsk, and Mission Specialist Richard Linnehan.

seated on the flight deck during ascent, and views of the re-entry and landing of Columbia through the crew cabin windows. This video will be broadcast on NASA Television.

The goal of the STS-78 mis-

sion is to help set the stage for the International Space Station by studying the effects of long-duration space flight on human physiology and conducting the type of experiments that would

(See STS-78, Page 6)

Calibration system software nets 11 KSC employees prestigious Space Act award

Eleven Kennedy Space Center employees were recently honored with the prestigious NASA Space Act Award for software they have developed to streamline instrument calibration.

The recipients, all employees of EG&G Florida, Inc.'s Calibrations and Standards Laboratories at KSC, were honored in a ceremony with Center Director Jay Honeycutt on June 5 at Headquarters.

The automated calibration system consists of more than 60 software programs which enable computers to calibrate instruments used on the Shuttle program, in payload processing and other base support activities.

The Space Act Award was initiated in 1958 to reward NASA and contractor employees for significant technical contributions to the NASA mission awards.

The recipients will divide \$5,000 in award money.



PICTURED AT the Space Act Award presentation are, from the left, Ken Walla, associate general manager for EG&G Florida, Inc.; EG&G General Manager Dick Jolley; award winners Jeffrey Cheatham and James Lewis of The Bionetics Corp.; award winners Todd Dayton, Otto Fischer, Robert McKay Jr. and James Tidwell of Precision Fabricating and Cleaning (PFC); Center Director Jay Honeycutt; award winners William Frazier III and Thomas Brown of PFC; Paula Pokorny, Standards and Calibrations lab manager for PFC; Marv Jones, Director of Installation Operations; Dick Lyon, Director of Logistics Operations; H.T. Everett, chief of the operations support branch for the Logistics Directorate; Ray Kotowski, NASA logistics calibrations manager; and Kristen Riley, of KSC's Technology Transfer Office. Not pictured are award winners Lois Muse Lewis, Pery King, and Christopher Piehota, of PFC.

CFC thanks KSC



COMBINED FEDERAL Campaign chairwoman Irene Long, left, presents Center Director Jay Honeycutt with a certificate thanking Kennedy Space Center employees for an outstanding 1995 campaign. KSC employees raised nearly \$222,000 for the nearly 60 affiliated agencies during the 1995 effort. Long also presented Honeycutt with the CFC Chairman's Award recognizing outstanding participation from 1964 to 1996, during which time \$4 million has been raised. Specific directorates acknowledged for their 1995 efforts are the Office of the Chief Financial Officer, named the most improved KSC organization and the KSC directorate with the highest percentage of dollar goal obtained, and the Equal Opportunity Program Office, the KSC staff office with the highest percentage of dollar goal obtained.

Employees of the month



HONORED IN JUNE are, from the left, Julie Shalley, Logistics Operations Directorate; Oscar Gamboa, Equal Opportunity Program Office; Dana Bolles, Safety and Mission Assurance Directorate; Maria Smith, Administration Office; Jean Dilts, Office of the Chief Financial Officer; and Maria Dumoulin, Payload Operations Directorate. Not pictured are Leslie Alderman, Engineering Development Directorate; Bryce Collins, Procurement Office; and Carlos Estrada, Shuttle Processing Directorate.

Biomass chamber sprouts wheat, potatoes in landmark study

By Joel Wells

Life scientists at Kennedy Space Center (KSC) have initiated NASA's most realistic test to date on plants being used for human life support in space.

The study began June 11, when workers planted 128 potato plants and 6,500 wheat seeds in KSC's Biomass Production Chamber (BPC).

During the experiment, researchers from NASA and Dynamac Corporation, KSC's Life Sciences Support Contractor, will evaluate the ability of a "bioregenerative" life support system to produce food and oxygen, purify water, and recycle waste products for long duration space missions.

The landmark study, part of NASA's development of a Controlled Ecological Life-Support System, is scheduled for a full year and could last up to three years. It marks the first time two crop species have been grown simultaneously in the BPC.

"We recently completed a



NEIL YORIO, a plant physiologist with the Dynamac Corp., moves a potato plant from a test tube, where it was grown under sterile conditions for four weeks, to a hydroponic tray in KSC's Biomass Production Chamber located at Cape Canaveral Air Station.

study with potatoes that lasted about 14 months," explained NASA agricultural engineer John Sager. "If we plan to live in space though, we must determine if this system will be as successful over longer periods of time."

Through photosynthesis the wheat and potatoes will produce food, distilled water and oxygen,

while removing carbon dioxide from the air.

Gradually, researchers will introduce plant and human waste streams from a "bioreactor" to the BPC, and through transpiration the plants will remove and use nutrients from the waste effluent. "In effect, plants may be the air and water filters of the space age,"

said Ray Wheeler, NASA plant physiologist.

The BPC, a retrofitted test chamber from the Mercury Space Program, has an interior composed of two plant chambers. A hydroponic system is used to supply the plants with nutrients and water. Tanks outside the chamber store the water and nutrient solution and special lamps provide artificial sunlight. The controlled environment imitates the confined and resource deficient conditions of space.

KSC scientists have been using the chamber almost continually since 1987, observing a variety of crops including soybeans, lettuce, tomatoes, white potatoes and wheat. This study focuses on wheat and potato production because of their high productivity and performance in previous trials.

"We hope to see the same positive results and high yields in this study that we have seen in the shorter preceding studies," said Dynamac plant physiologist Gary Stutte.

Applications taken for engineering master's program at KSC

Applications are currently being taken for the master of science program in engineering management offered on-site at Kennedy Space Center by the University of Central Florida Department of Industrial Engineering and Management Systems. The program is open to NASA and contractor employees of KSC.

An informational session will be held June 26 at 4 p.m. at the NASA Education and Training Center, located at Second Street and B Avenue. Applications are due August 1 but early application is encouraged.

The program is designed to better prepare engineers and scientists with focused technical backgrounds to move into broader project management positions. More than 250 KSC scientists and engineers have

graduated from the program to date.

Classes will begin on Tuesday, August 27 and will meet on Tuesdays and Thursdays from 4 to 7 p.m. in the NASA Training Building. The program runs for six semesters (including summers) and includes two courses each semester that are taught by UCF Industrial Engineering faculty. All classes are videotaped for students who have to miss because of travel or work commitments. The 12 courses cover people, financial and systems aspects of project management.

Applicants must have a bachelor's degree in engineering, science or mathematics. Admission requirements are a 3.0 GPA in the last two years of undergraduate work or a score of 1000 (verbal plus quantita-

tive) on the GRE. Students not meeting the admission requirements may be considered on a conditional basis. Students must have completed a course in differential equations prior to graduation.

Applicants are generally sponsored through their employer's training office. Cost is \$1,100 per semester, not including fees for books. A deferred payment plan is available at a nominal fee for students awaiting tuition reimbursement by their employers.

Application packets are available at KSC by contacting Cassie Spear, UCF liaison at KSC, at 459-9326, or by contacting the UCF Center for Outreach Credit at 407-823-6227 or Charles Reilly, KSC program manager at 407-823-2204 or reilly@iems.engr.ucf.edu.

Federal women award scholarships

The Spacecoast Chapter of Federally Employed Women recently presented scholarship awards to thirteen high school and undergraduate college students. Selections were based on application, scholastic and academic achievements, written references, and personal interviews. Scholarship values ranged from \$250 to \$1,000.

Recipients, all employees, spouses or dependents of KSC employees, are:

Amey Lueck, Catherine Potteiger, Amy Snyder, Frances Sandborn-Spiess, Jennifer Kuglemann, Jennifer Tharpe, Jennifer Blom, Jennifer Opresko, Karoly Purer, Kimberlee Snyder, Michele Luecking, Robert Rauch and Sarika Mehta.

KSC engineers recognized for working with industry to solve technical problems

By Joel Wells

Twenty Kennedy Space Center engineers were recently recognized by NASA and the state of Florida's Technological Research and Development Authority (TRDA) for providing technical help to hundreds of Florida businesses.

Awards were presented state Sen. Patsy Kurth during the 2nd Annual NASA/TRDA Technology Outreach Program Workshop on June 6.

"The event focused on how KSC and the state of Florida cooperate to extend the benefits of space exploration and research to businesses across the state," said Frank Kinney, TRDA's executive director. TRDA is an independent state agency which provides space-related education and research grants as well as working with NASA to promote technology transfer to industry. KSC's Technology Programs and Commercialization Office has received 434 requests for help from businesses in the southeastern United States in the past year, of which 374 came from Florida companies. The requests are submitted in the form of a Technology Transfer Agreements or problem statement. "The simplicity of initiating a Technology Transfer Agreement is one of the reasons we have seen such a positive re-

sponse to the program," said Chuck Griffin, KSC's Technology Outreach coordinator. "Sometimes we receive the one-page applications filled out by hand."

A committee of NASA and contractor employees review each problem statement and then assign it to an engineer with expertise in that area. "Companies have presented problems that range from re-designing dentistry tools to keeping sea turtles out of a nuclear power plant's intake canal," said Griffin.

NASA allows the engineer to work the problem directly with the company for up to 40 hours.

"If you think of the hours of free talent and expertise that small businesses can now tap into through this program, the economic impact is quite obvious," said Kurth.

The award recipients from NASA, EG&G Florida, Inc., Dynamac Corporation, I-NET, Inc., Lockheed Martin Space Operations and McDonnell Douglas Aerospace and Defense Systems are credited with successfully closing 283 of the problem statements to date.

"This program is already proving its worth within the first year of operation at KSC," said Bill Sheehan, of KSC's Technology Programs and Commercialization Office.



of branches, twigs and string. It was discovered during a walkdown prior to the hypergolic loading for Mission STS-78. Officials, concerned the nest could be a fire hazard, decided to move it.

Fledglings launch new lives

WHALEY carries a fledgling to a safe area outside of the oxidizer building in preparation for moving its nest. Since the fledglings were found to be old enough to leave the nest on their own, it was destroyed.



Lockheed Martin, Rockwell employees begin transition to United Space Alliance

More than 3,800 Shuttle Processing Contract employees at Kennedy Space Center this month began the process of transitioning badges from Lockheed Martin Space Operations to the new Lockheed Martin-Rockwell International joint venture United Space Alliance.

Work flows have not been affected by the changeover, which consisted primarily of obtaining



new company badges.

New NASA picture badges will be issued in the near future. Lockheed Martin, Rockwell

and USA recently decided to include Rockwell's Orbiter Logistics Contract and Lockheed Martin's total Shuttle Processing Contract (SPC) in USA.

The remaining 1,850 SPC employees will transition to USA later this summer.

USA signed novation agreements with NASA April 12 allowing the company to assume responsibility for the SPC and

the Space Operations Contract (SOC).

Lockheed Martin and Rockwell formed USA in August 1995 in response to NASA's intention to consolidate the SOC.

NASA Administrator Dan Goldin announced in November that the agency would pursue an agreement with USA serving as the single prime contractor for Shuttle operations.

KSC trainer hopes to keep Olympic athletes injury-free

KSC exercise specialist Mary Kirkland will play a hands-on role in keeping Olympic athletes injury-free this summer.

Kirkland, who many KSC employees recognize as the coordinator of the "Back at Work" program and the biannual Intercenter runs, is a licensed/certified member of the National Athletic Trainers Association.

She will be traveling to Atlanta in July to work alongside the hundreds of athletic trainers selected to care for the athletes of the 1996 Summer Olympic Games.

Though athletic trainers are sometimes confused with personal trainers, Kirkland said, athletic trainers have the dual responsibility of keeping the athlete injury-free and evaluating, treating and rehabilitating those injuries that can't be prevented.

Although her first choices were gymnastics and track and field, sports she has extensive prior experience, she was assigned to work with basketball, a rather welcome surprise.

"People are already asking me if I'll get an autograph from Shaq," she said. Shaquille O'Neal of the Orlando Magic may be one of the better known Olympic athletes to participate in this summer's games but Kirkland expects her stargazing time will be limited.

She will be working with team physicians and other trainers anytime an athlete is hurt during an event or practice session.

Hoping for space in a



MARY KIRKLAND will be tending to Olympic basketball teams at the Games in Atlanta next month.

Georgia Tech dorm room, Kirkland will primarily be working second shift duty, with a couple of days off between weekly shifts.

"I'm sure I'll be learning techniques that I can bring back here to the exercise facilities," she said.

Kirkland is excited at the prospect of working with some of the top athletes and trainers from the U.S. and around the world.

"It is a unique opportunity," she noted, "to learn the latest and most innovative rehab techniques and bring them back to benefit KSC and its employees."

Authorized to take up to four weeks off for the volunteer stint, Kirkland hopes to bring back a wealth of experience and treasured memories of a once-in-a-lifetime event.

And, just maybe, an autograph or two!

Olympics. . .

(Continued from Page 1)

cialist Susan Helms will travel to the Visitors Center to cheer runners on and present to Olympic officials a replica torch and an Olympic banner they will be carrying with them on their mission.

A stage for the celebration ceremony will be set up in the parking area just in front of the Rocket Garden.

The event is scheduled to begin at approximately 3 p.m. with a welcome by Center Director Jay Honeycutt and the introduction of the STS-78 crew members. Hugh Harris, director of Public Affairs, will serve as mas-

Olympics events, will be displayed throughout the Olympic venue.

The spinoffs display will be exhibited near NASA's full-scale mock-up of the International Space Station's U.S. Laboratory which will travel to the games from the Marshall Space Flight Center in Huntsville, AL.

The hands-on exhibit, housed in two 48-foot trailers, recreates the station's living quarters, connecting nodes, U.S. Science Laboratory and Space Shuttle docking tunnel. KSC will help staff these displays as well.

In addition to supporting NASA and KSC's role in the Olympics, Richards has a personal interest as well. She has



A FULL-SCALE mockup of the International Space Station's science laboratories and the crew's living quarters is housed in these two 48-foot trailers which will be on display at the Olympics in Atlanta next month.

ter of ceremonies and will introduce each KSC torch bearer. The Melbourne Municipal Band and the Challenger Fife and Drum Corps will provide entertainment beginning at 1 p.m.

In addition to hosting the torch run, KSC will have a representative at the Olympics. Joni Richards, the marketing lead for KSC's Technology Programs and Commercialization Office, will oversee KSC's "NASA Spinoffs - From Space to Sports" display which will feature several sports-related products including bicycle helmets, bicycle racing wheels and others. Posters, depicting additional spinoff products related to

been selected to carry the torch through Orlando after its arrival at KSC.

KSC runners are:

Lee Harrison Davies, Jane Hodges, Joanne Maceo, Robert Nagy, Jr. and Loren Shriver, NASA; Kathleen Weaver, EG&G; Mark Chappell, Sara Delamonte, Claude Overfelt, Michael Charles Phillips, Deborah Prongue, Robin Seymour and Marty Winkel, Lockheed Martin Space Operations (now United Space Alliance); Thomas Anderson and Donna Lee Hoven, McDonnell Douglas; and Theresa Clifton and Richard Unrue, Rockwell International.



A HISTORIC tracking antenna is mounted on a pedestal at the Merritt Island Launch Area tracking station.

Historic antenna finds new life at MILA

By George Diller

A tracking antenna with a historic past has just been added to the myriad of eclectic communications antennas at the Merritt Island Launch Area (MILA) tracking station at the Kennedy Space Center.

Mission managers recently discovered that during Space Shuttle launches MILA's existing omni-directional UHF antenna, which is small and non-steerable, may not be fully effective if a Return to Launch Site (RTLS) should occur. The antenna allows voice communications between the Shuttle and ground controllers. The secondary antenna would serve as a back-up, but both are required to be available during launch for voice communications should an RTLS occur.

Although another comparable antenna is located at the Ponce DeLeon Inlet tracking station at New Smyrna Beach, it is not steerable and is too far north of the Cape to serve as a back-up.

The Allied Signal operations team at MILA and NASA's management team from

Goddard Space Flight Center, responsible for MILA's tracking support, began looking into ways to meet the RTLS requirements without having to purchase a new antenna.

The solution was found at NASA's ground tracking station at Dakar, Africa. The station, originally established for the Apollo program, continued to serve duty for the Space Shuttle era but was recently closed with the completion of a full constellation of space-based Tracking and Data Relay Satellites. A UHF antenna from that site, which was steerable and complete with a four element array had been shipped back to the United States.

An engineering team at Goddard fully refurbished the nearly two-decades old antenna to like-new condition and shipped it to KSC.

The antenna was hoisted atop its support pedestal at MILA on June 6 and is being tested with the STS-78 launch. If the antenna operates successfully, it will be used as a fully operational antenna for all upcoming Shuttle launches.

STS-78...

(Continued from Page 1)

fly on the orbital platform. Columbia will climb to a 173-statute-mile high orbit with a 39-degree inclination to the Earth's equator to allow the seven-member flight crew to maintain the same sleep/wake rhythms they are accustomed to on Earth and to reduce vibrational and directional forces that could affect on-board microgravity experiments.

Once in orbit, the crew will enter the 40-foot pressurized Spacelab module to begin the 22 LMS life science and microgravity experiments in the laboratory and in lockers in the middeck area of the orbiter's crew cabin. Thirteen of the life sciences experiments will be devoted to the study of the effects of microgravity on human physiology, while six will be conducted to produce metallic alloys and protein crystals and study the behavior of fluids and materials processing.

Throughout the mission, the crew will be working with scientists from the European Space Agency (ESA), Canadian Space Agency (CSA), French Space Agency (CNES), Italian Space Agency (ASI) and NASA in the Payload Operations Control Center at the Marshall Space Flight Center and six remote sites. Three of these sites will be at NASA centers, including Hangar L at Cape Canaveral

Air Station.

The 13 human physiology experiments are designed to provide additional information on how the body adapts to the near-zero gravity conditions found in orbit.

Three space biology experiments in the middeck crew cabin lockers — the Animal Enclosure Module (AEM), Space Tissue Loss-Configuration B (STL-B) and the KSC-designed Plant Growth Facility (PGF) — will also be on board to study how microgravity affects the basic mechanisms of both animal and plant physiology.

The STS-78 crew includes astronauts representing the French Space Agency and the Canadian Space Agency, as well as two medical doctors and a veterinarian. The three veterans are Mission Commander Terence T. "Tom" Henricks, Pilot Kevin R. Kregel and Payload Commander and Flight Engineer Susan J. Helms. Mission Specialist Richard M. Linnehan is on his first Shuttle mission. Mission Specialist Charles E. Brady, Jr. has been a flight surgeon for the U. S. Navy's Blue Angels aerobatic demonstration team. Payload Specialist Jean-Jacques Favier is a French Space Agency astronaut. Robert Brent Thirsk is the chief astronaut for the Canadian Space Agency. If the mission is extended, landing is scheduled at the KSC Shuttle Landing Facility runway at 8:51 a.m. July 7.



John F. Kennedy Space Center

Spaceport News

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