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# Spaceport News

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

John F. Kennedy Space Center

## Mission update



**Mission:** STS-76 on Atlantis.

**Status:** Space Shuttle Atlantis returned to Earth March 31 with an 8:29 a.m. EST landing at Edwards Air Force Base, Calif. NASA's 747 Shuttle Carrier Aircraft (SCA) which was returning Atlantis to KSC made a precautionary landing at Edwards at 1:10 p.m. PST April 5 when a fire warning light came on for engine No. 3, the right inboard engine. The crew shut down the engine as a precaution and returned to Edwards. At press time the return flight was tentatively scheduled to depart Edwards on April 11.



**Mission:** STS-77 on Endeavour.

**Launch date, time:** May 16, 6:32 a.m. from Launch Pad 39B.

**Primary payloads:** SPACEHAB-04 which will carry experiments ranging from the growth of crystals to the separation of organic materials using aqueous techniques. The Spartan/207/Inflatable Antenna Experiment will test inflatable antenna technology.

## April 12, 1981 - April 12, 1996 15 years of Shuttle exploration

*"The flight of STS-1 and the many which have followed is a tribute to the NASA/contractor team and the American spirit. . ."*

-- Jay Honeycutt  
Center director



The Space Shuttle Columbia breaks free from Launch Pad 39A for the first time on April 12, 1981, carrying Commander John Young and future Kennedy Space Center Director Robert L. Crippen. KSC Director Jay Honeycutt was technical assistant to John Yardley, the associate administrator for the Space Transportation Systems in 1981. He recalls:

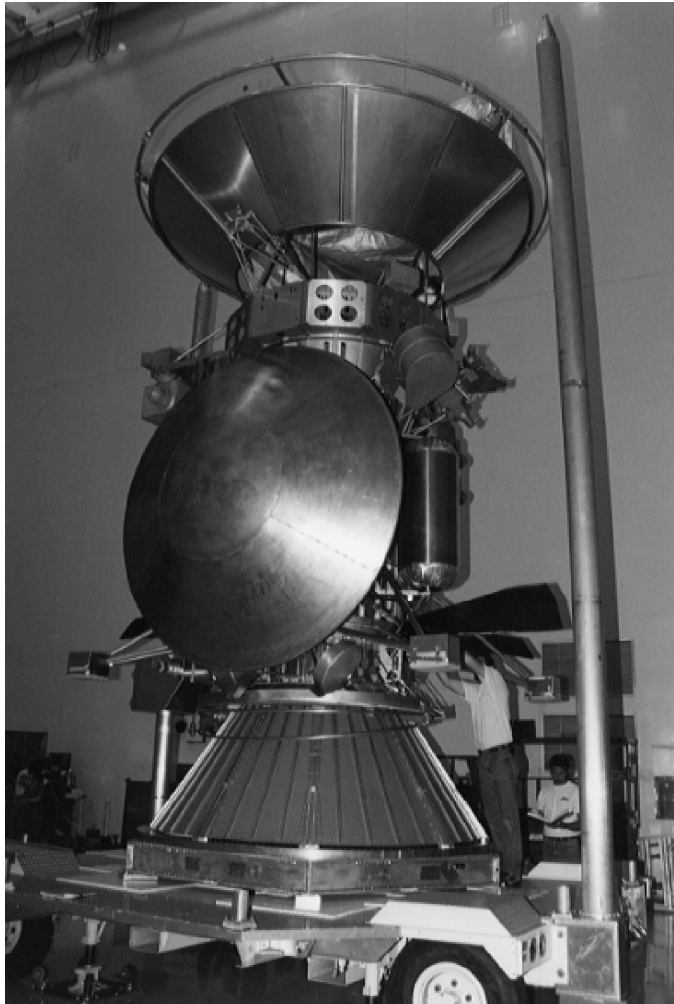
"Hundreds of us had invested years of effort in the Shuttle program development. When Columbia cleared the pad on its maiden voyage I felt a sense of triumph and relief that what we had labored over so long worked so well. It was, and continues to be, a tribute to the able men and women of KSC who care for and launch the Shuttle."

Following launch Richard G. Smith, KSC center director at the time, expressed a sentiment that still applies today:

"We have come down a long and sometimes bumpy road, but the results of our patience and effort can be seen today in every face in the NASA/industry team. The resounding success of the first flight is a legitimate source of pride for all of us.

"But let us not be so blinded by our pride that we lose sight of the road ahead. The mission of the Space Shuttle is to fly safely again and again. We must be prepared to make the same efforts, to exercise the same diligence each and every time."

(See STS-1, Page 3)



THE CASSINI TRAILBLAZER, a model of the NASA/Jet Propulsion Laboratory Cassini spacecraft to be launched to Saturn, was transported from Kennedy Space Center's Payload Hazardous Servicing Facility (PHSF) to Launch Complex 40 on Cape Canaveral Air Station on April 3. Cassini will be launched aboard an Air Force Titan IV rocket in October 1997. The purpose of the exercise is to fit-check the model with launch vehicle and pad interfaces, check access to the spacecraft for personnel and equipment, and validate timelines and procedures to be used once the actual Cassini spacecraft arrives at the pad for launch next year.

## Daughter's Day scheduled for April 18

NASA employees at Kennedy Space Center can show their daughters their work environment during the third annual "Take Our Daughters to Work Day" April 18. The day is part of a public education program nationwide to break down gender and racial barriers and show young women career options available to them.

NASA employees may bring daughters aged nine or older to their work areas on both KSC and Cape Canaveral Air Station. Contractor employees should contact their management to see if a similar program is available.

In addition to parents, family members and other NASA KSC employees are allowed to sponsor girls and more than one daughter in a family is eligible to attend.

Featured during the day's activities will be talks by Victoria "Vicki" VanMeter and Elizabeth "Libby" Massey. Vicki VanMeter is a seventh grader who, in 1993, became the

youngest person to pilot a single-engine plane east to west across the United States. A year later she flew to France, capturing the international record for being the youngest person to perform a solo transatlantic flight.

Massey began her career at KSC in 1980 in the Equal Opportunity Office. She later moved to the Public Affairs Office and ultimately transferred to NASA Headquarters in Washington, DC. She recently retired from federal service with more than 25 years of training and speaking experience.

Participants will also see a video titled "Astronauts' Smiles" and will have an opportunity to visit the Exploration Station which is located in the Center for Space Education.

In the afternoon, participants and their sponsors will have the opportunity to visit and tour work sites. Certain areas will be off limits, including, in the Industrial Area, the Hypergol

(See DAUGHTERS, Page 6)

## Employees of the month



HONORED IN APRIL are, sitting from the left, Macel Pargeon, Chief Financial Officer's office; Cathy Parker, Logistics Operations Directorate; and Cindy Wicker, Shuttle Operations Directorate. Standing from the left are, Charles Ihlefeld, Payload Operations Directorate; David Banks, Procurement Office; and Mark Mason, Administration Office. Not pictured are Charles Wendling, Payload Operations Directorate; Terese Kozmoski, Public Affairs Directorate; and Pamela Hales, Safety and Mission Assurance Directorate.

## Strategic plan spells out Agency goals

Recently, the Agency Strategic Plan was distributed to civil service employees and to the heads of our major contractor organizations. The plan provides us with a common basis for planning and a framework for the direction the Agency is headed over the next few years. The plan defines the Agency through its five Strategic Enterprises: what they do and how they relate to the Agency and each other.

Each of you should familiarize yourself with the plan and NASA's Strategic goals.

The Strategic Plan for the Human Exploration and Development of Space (HEDS) will be available in a few weeks. As you know, it is the primary enterprise that KSC supports. You also will need to familiarize yourself with the HEDS plan. The challenge for all of us is to read it carefully and determine how best we can help KSC accomplish our goals under the Plan.

  
Jay F. Honeycutt



## Wildlife find KSC can be hazardous

*While working on a wildlife refuge has untold rewards, it also produces some unexpected consequences. In light of the following incidents, Kennedy Space Center employees are advised to stay aware of the responsibilities of sharing space with various wildlife and be prepared for the occasional close encounter.*

**STICKY SITUATION:** Although they are intended to catch mice, rats and insects, super glue boards (commonly known as sticky pads) frequently catch other unsuspecting animals as well. During mid-March, a grey phase eastern screech owl became en-



A GREY PHASE eastern screech owl was brought into the Merritt Island National Wildlife Refuge Headquarters after it became adhered to a glue board.



WILDLIFE OFFICERS were able to dissolve the glue with vegetable oil, thus freeing the owl.



THE OWL was released after three days at a wildlife rehabilitation facility.

trapped on a such a board and was taken to the Merritt Island National Wildlife Refuge Headquarters by the Cape Canaveral Air Station employees who found it. Most of the small owl was stuck to the board, including the side of its face, one eye, one ear, the breast, both wings and both feet. It would have been impossible for the owl to free itself from the board and it likely would have died of starvation in a few days.

After trying unsuccessfully for a few minutes to remove the owl by gently pulling and clipping feathers away from the board, one of the Fish and Wildlife staffers noticed that instructions on the underside of the board recommended using vegetable oil to loosen the glue's hold. When oil was applied the owl's feathers immediately began to loosen and the bird was freed.

Following a trip to a local veterinarian and three days at a wildlife rehabilitation facility, the owl appeared healthy, was eating well and showed no signs of injury. It was taken back to the refuge and released into a wooded area.

**OPOSSUM OVERLOAD:** One evening late last week Judy Cassidy and Monzy Mathews of Lockheed Martin's Environmental Health and Safety Office were using their flex-time schedule to catch up on some work in their offices located in Complex B, Vehicle Assembly Building area. Both were bent over their desks concentrating on the work at hand, when Mathews caught a movement out of the corner of his eye. His startled reaction was shared by his visitor who veered across the hall and into Cassidy's office. In one rapid movement, Cassidy levitated to the top of her desk as she and Mathews watched their visitor—a rather portly opossum—sedately waddle toward, and finally underneath, one of Cassidy's bookshelves. While KSC environmental health and safety issues are under the purview of their office, no applicable guidelines immediately came to mind, and EG&G patrolmen Jerry Brenneke and Jim Rankin were summoned to assist. "Shortly after Jerry arrived, the opossum went into labor and delivered at least two babies," Cassidy said. When the new babies were tucked away in the mother's pouch, patrolman Brenneke managed to gingerly lift the new mother and deposit her outside the building. "It's amazing," Cassidy said, "the opossum showed no fear at all. When the patrolman picked her up, she showed her teeth, but did not wiggle or make any noise. When he put her down outside, she simply walked away as if our encounter was nothing unusual for her." For Cassidy, Mathews, Rankin and Brenneke, her visit is something that they will not soon forget.

## STS-1...

*(Continued from Page 1)*

Following the flight, Young told a crowded press conference that the orbiter was an incomparable flying machine, and surprisingly easy to control. He said the mission was "what NASA calls nominal, although I think you're going to have to call it phenomenal."

Asked recently whether the next 15 years had met his expectations of the time, Crippen said, "I was mainly concerned with getting STS-1 off and carrying out a successful mission. However, I was always excited and optimistic about the program and think it has achieved most of what I anticipated."

"The Shuttle was built to ferry people and supplies to a space station so I am very pleased to see it visiting Mir on a regular basis and with the U.S. having a permanent presence in space," Crippen added. "I'm looking forward to the construction of the International Space Station and continuing Shuttle missions well into the next century."

## And the winner is...



JUNE PEREZ, secretary to Associate Director Al Parrish, models a Planet Hollywood jacket and displays a miniature Oscar she received after being selected as a winner in *The Orlando Sentinel's* Oscar competition. Perez's name was drawn from the thousands of entrants who predicted winners in the annual film industry competition. Perez and a guest were treated to an Oscar night party at the Planet Hollywood restaurant in Orlando. The evening was hosted by Jay Boyar, film critic for *The Sentinel* and Barbara West, of WFTV-Channel 9, and included photo shoots, contests, a dinner buffet and a silent auction. Proceeds benefitted *The Sentinel's* Charities Fund.

## Ultrasonic flow meter could help streamline prelaunch operations

By Chuck Weirauch

An ultrasonic measuring device that generates sound waves similar to those used for medical diagnoses could save time and money during Space Shuttle prelaunch operations, according to a group of KSC engineers.

"Unlike conventional flow meters, the ultrasonic flow meter components can be attached to the side of a pipeline with a Velcro fastener," said Rudy Werlink, a NASA engineer in the Automated Systems and Analysis Division of the Mechanical Engineering Directorate.

"Since it is not in the pipe, the lines would not have to be taken apart for flow meter repair or calibration."

### Maintenance adds up

Such maintenance is particularly costly on lines that transfer hazardous materials to the Shuttle at the launch pads, Werlink said.

For example, the conventional turbine flow meters in the monomethyl hydrazine fuel and nitrogen tetroxide oxidizer lines for the Orbital Maneuvering System (OMS) and Reaction Control System (RCS) must be removed for calibration after almost every mission processing flow.

This work requires a Self-Contained Atmospheric Protective Ensemble (SCAPE) operation to protect employees from contamination.

"The estimated annual cost for this work alone is approximately \$38,000," Werlink said. "This figure does not include the indirect costs of the decontamination, rebuilding, recertification and handling of the flow meters. The use of ultrasonic flow meters would completely eliminate these expenses."

The new meters and data acquisition system hopefully can also help provide more accurate



WITH THE ORBITER Columbia's vertical stabilizer in the background, NASA engineer Rudy Werlink (left) and Ravi Margasahayam pose at Launch Pad 39B with the remote data collection system for the ultrasonic flow meters attached to the monomethyl hydrazine and nitrogen tetroxide lines at the pad. One of the meters can be seen on the line in front of Werlink.

control of hypergolic fluid loading operations for the OMS and the RCS, said I-NET, Inc. principal engineer Ravi Margasahayam.

Precise indications of just how much fuel and oxidizer are loaded is essential to assure that the correct amount of fluids are onboard for critical orbiter in-flight maneuvers and a safe return to Earth, he said.

Just how accurate these measurements can be will be determined by the data recorded during the processing flows of the STS-75, STS-76, STS-77 and STS-78 missions.

Werlink and Margasahayam, along with Andy Kelley of NASA, Allen Crawford and Mike Brooks of I-NET, and Kevin Ahrens and David Sutherland of Lockheed Martin Space Operations, have installed ultrasonic flow meters on the OMS and RCS lines on the pad and will conduct analyses to determine the performance of the devices.

### Good performance

Preliminary indications are that the ultrasonic meters are performing at least as well as conventional meters, Margasahayam said.

"The meter consists of two transducers that send and re-

ceive ultrasonic pulses through the line during loading operations to record flow velocity," Werlink said.

"The data they gather is sent to a signal processor and stored. The unit includes a cellular link that allows us to also record the data remotely through a cellular telephone while viewing it on a remote PC monitor in near real-time to determine the flow rate and total flow."

### Other uses possible

Both the ultrasonic technology and the cellular link have considerable potential at KSC, according to project team members.

There are many fluid and gas lines that could be monitored with a remote metering station like the one on the RCS lines because they carry hazardous substances or are in areas that are difficult or time-consuming to reach.

"Our next ultrasonic meter project will be a remote monitoring system on the helium lines that run out to the pads," Werlink said.

"We also hope to establish a Self Contained Cellular Data System (SCCDS) that will eventually provide remote access to data-gathering sensors throughout the center."

## Space Congress themes are set

The Thirty-Third Space Congress, scheduled for April 23-26, will feature panel discussions focusing on where the space program is headed. Amongst the themes are "Future of the Commercial Space Industry," "Scientific Programs in a World of New Technology," "Government Trends in a post Cold War Space Environment," and "A Perspective of the Future from NASA Center Directors."

Technical papers will provide detailed insight on issues including future launch vehicles and facilities, space business aspects in a commercial market, the future of commercial satellites, Space Station/Mir, planetary programs and space education for tomorrow.

An array of distinguished speakers, panel members and technical paper presenters are scheduled as well as space-oriented exhibitions presented by companies and organizations at the leading edge of the space industry. Also returning are the popular science fair and a "Meet the Astronauts" panel.

Exhibits will include a showcase exhibit, computer graphics demonstrations, and displays of the Space Shuttle, Shuttle payloads, space station, expendable launch vehicles and other space related activities. The exhibit halls will be open to the public in the Cocoa Beach Hilton and the Comfort Inn & Suite Resort on Tuesday, April 23 from 11 a.m. to 7 p.m.; Wednesday, April 24 from 11 a.m. to 8 p.m. and Thursday, April 25 from 9 a.m. to 3 p.m.

Regional youth science fair displays will be open to the public April 23-25, in the Dolphin Room at the Holiday Inn. Exhibits will be judged and awards presented on Thursday evening, April 25.

The Missile, Space and Range Pioneers' cocktail party and banquet at the Patrick Air Force Base Officers' Club will commence at 6:30 p.m. on Friday evening, April 26.

# Picnic offers employees opportunity to eat up, wind down

by George Diller

The KSC All American Picnic at KARS Park will happen this year on Saturday, April 27 from 10 a.m. to 4 p.m.

Tickets go on sale today at all NASA Exchange stores. Advance tickets are \$3 for adults and \$2 for children aged three to 12. Children under three will be admitted free. Tickets purchased at the gate will be a dollar more.

The ticket price includes admission to the park, lunch, refreshments, entertainment and all the children's activities. For an additional dollar, a ticket can be purchased for the traditional chili cook-off.

Center Director Jay Honeycutt will lead the opening ceremonies at 10 a.m. A precision sky diving team will start things off by performing a jump with American and Prisoner of War flags. The Community Band of Brevard, a 60-piece concert band comprised of non-professional musicians, many of whom are KSC employees, will also perform.

An auto show featuring antique cars, street rods, custom cars, muscle cars and race cars will take place from 10 a.m. to 2 p.m. and will be followed by the presentation of awards and door prizes.

The featured entertainment is Max Q, a rock band made up of astronauts, which is scheduled to play at 12:15 p.m. Musicians



include Carl Walz, lead vocalist; Hoot Gibson, lead guitar; Kevin Chilton, guitar; Jim Wetherbee, drums; Susan Helms, keyboard; and Chris Hadfield, bass. Band members have wanted to perform at the picnic for several years, however, this is the first time they have all been able to be together at the time the picnic was scheduled.

Other events include:

- \* Performances by groups including Bravo Hotel, a band made up largely of KSC employees; Reflections, a jazz, rhythm and blues, and "Motown Sounds" band; Hired Guns, a pop country band; The Herbie K dancers, who perform to music of the 1950's; the Mayalinda Marimba Band, well known for their performances at Epcot over the last 13 years; and the Talako Indian dancers. A demonstration of a Japanese traditional drum is also scheduled.

- \* Ethnic food and crafts booths featuring Mexican, Cajun and Vietnamese food and

Southern BBQ. Attendees can vote on the most creatively decorated booth.

- \* The traditional dunking booth sponsored by the NASA Kennedy Management Association (NKMA).

- \* Sports events, including tennis, softball, volleyball and horseshoes, beginning at 8 a.m. and running until noon. At noon the Olympic Pentathlon, featuring a softball shot-put, frisbee discus throw, basketball hoop toss, relay race and tug of war, will begin for students ages 10 -15 and 16 and older.

- \* Children's activities which include an all-day Children's Space Carnival, launches of several different model rockets, balloon sculptures, face painting, a magic act, train rides, pony rides and a petting zoo. This year three new playground areas have been opened around the park, which have tunnels, slides and climbing bars.

Picnic volunteers are still needed. If you can help, call Shirish Patel at 7-9857 or 7-4066. Also, the KSC All American Picnic Committee is looking for organizations that would like to sell their ethnic food specialties and/or crafts. For information call Wanda Harding at 7-6174.

Information on the picnic is available over the Internet at: <http://www.ksc.nasa.gov/events/1996/picnic/picnic.htm>

The picnic is sponsored by the Payload Operations Directorate.

## KSC to highlight NASA technology at Lakeland's Sun 'n Fun airshow

by Joel Wells

KSC representatives will exhibit NASA-developed technology and speak to aviation and aerospace enthusiasts at the Experimental Aircraft Association's (EAA) Sun 'n Fun Airshow in Lakeland April 14 - 20.

The convention encourages sport aviation and provides a myriad of entertaining and educational activities and forums. Sun 'n Fun is dedicated to perpetuating sport aviation through education and safety programs and the preservation of America's aviation heritage, said EAA spokesperson Bonnie Higbie.

NASA's accomplishments in the aerospace and aviation industries secure its place in that heritage. The KSC Technology Utilization office will present an

eye-opening exhibit featuring a wind sensor device that transmits important information to pilots landing at non-controlled airports.

Education representatives from the KSC Public Affairs staff will provide informative videos and handouts at their exhibit. Another KSC exhibit will allow visitors to pilot a shuttle landing simulator, view an authentic moon rock, and meet the Spaceman from the KSC Visitor's Center.

A series of forums are planned on a variety of topics, including NASA's efforts to solve aviation problems. The forums are scheduled for Friday and Saturday, April 19-20.

Daily airshows will feature homebuilt airplanes, warbirds, antiques, helicopters and the latest aviation designs. World

renowned aerobatic champions and ultralight pilots will demonstrate their skills as well.

Airshow organizers enlisted America's first family of fireworks for a unique pyrotechnic display on Friday, April 19 at 8 p.m. The Grucci family, known for their memorable shows at the presidential inauguration, Bicentennial of the Constitution and the Statue of Liberty Centennial celebration, promise an unforgettable show.

The Shell Oil Company is bringing its Formula 1 racing plane to challenge any piston aircraft to a drag race. The winner receives a check for \$5,000.

Formula 1 pilot, Bruce Bohannon credits NASA for increasing his plane's performance. We would not be able to do the things that this small plane is doing without the aero-

dynamic design and engine performance changes suggested by NASA representatives, said Bohannon.

KSC managers hope to communicate the benefits of NASA-developed technology to the 700,000 aviation buffs expected to attend throughout the week.

We see this as an excellent forum to promote NASA's accomplishments in technology, said Jim Aliberti, KSC's Manager of Technology Transfer and Commercialization.

General admission for attendees not planning to visit the flightline is \$16 daily. Pilots, affiliated EAA members, badged KSC employees and their immediate families have access to the show and flight line for a fee of \$17 daily. For more information call Sun 'n Fun at (941) 644-2431.

## Compton Gamma Ray Observatory celebrates 5-year anniversary

NASA's Compton Gamma Ray Observatory marked its five-year anniversary April 5. Launched in 1991 from the Space Shuttle Atlantis, the Compton Observatory is the second in a series of Great Observatories and is the heaviest spacecraft ever deployed by a Shuttle.

The spacecraft, named for American Nobel Prize-winning physicist Arthur Holly Compton, is the first satellite dedicated to making gamma ray observations across a broad spectrum of energies. Scientists believe that gamma rays, which are an invisible highly energetic form of radiation, are emitted during violent cosmic events such as supernovae, quasars, pulsars and black holes. NASA scientists are using the Compton Observatory to create a comprehensive map of celestial gamma ray sources.

"The spacecraft and instruments have been remarkably reliable, and all four instruments are performing near their design specification," said Dr. Neil Gehrels, Project Manager of the Compton Observatory at the Goddard Space Flight Center (GSFC), Greenbelt, MD. "Thus far Compton has made extraordinary discoveries, and the science team is looking forward to more discoveries as the

observatory begins its sixth year in space."

While tape recorders on the observatory failed early in the mission, their failure turned out to be an unexpected scientific bonus.

Instead of storing data on the spacecraft and retrieving it every four hours, scientists can now receive a 24-hour-a-day stream of data in real time. This allows scientists to quickly begin monitoring outbursts of energy, such as on Jan. 31, 1993, when the satellite detected the highest energy gamma rays ever seen in a burst, an event dubbed the "Super Bowl Burst." In December 1995, the Compton Observatory detected the sudden appearance of a never-before-seen type of object which bursts and pulses at the same time. This bursting pulsar is currently the brightest source of gamma rays and X-rays in the sky.

Among the Compton Observatory's most significant discoveries:

- Gamma ray bursts are evenly distributed across the sky, which suggests that gamma rays are coming from the farthest reaches of space and not just from our own Milky Way galaxy, as astronomers once believed;

- Gamma ray bursts and solar flares are accompanied not

only by a release of low-energy gamma rays over a relatively short period of time (tenths of seconds to seconds) but also by a release of high energy gamma rays over a longer period of time;

- Gamma-ray emitting active galactic nuclei, known as Seyfert galaxies, emit most of their gamma-rays at lower energies than previously thought. This is important evidence that such objects may be the source of diffuse gamma rays;

- A threefold increase, from two to six, in the number of pulsars known to emit gamma rays

- The first detection of the presence and nuclear decay of cobalt 57, an isotope of cobalt thought to have been created

during the explosion of a star known as Supernova 1987A.

- The first mapping of the distribution of a radioactive isotope called Aluminum 26 within the Milky Way galaxy. The instruments on CGRO detect the isotope by measuring gamma ray energy associated with its radioactive decay.

The Compton Observatory is currently in a circular, 240-mile-high orbit inclined 28.5 degrees to the equator.

NASA is considering reboosting the 17-ton, low-Earth-orbiting satellite to a higher orbit that would allow the spacecraft to continue to track the gamma ray universe well into the next century.

## Daughters. . .

(Continued from Page 1)

Maintenance Facility (HMF) and the Launch Equipment Test Facility (LETF); in the Launch Complex 39 area, the Rotational Processing and Storage Facility (RPSF); Vehicle Assembly Building (VAB); Orbiter Processing Facility (OPF) bays 1,2, and 3; Launch Pads 39A and B, and in the Launch Control Center (LCC), the Complex Control Center and Room 1P10 on the first floor, the Central Data Systems area and Record and Playback Systems areas 1 and 11 on the second floor, and firing rooms 1, 2, 3, and 4 on the third floor.

### Take Our Daughters to Work Day program April 18, 1996

**7:30-8 a.m.** - Badging, IMAX Theater lobby, KSC Visitor's Center

- Center director's welcome
- Guest speaker: Victoria VanMeter

- Video: Astronauts' Smiles
- Guest speaker: Elizabeth Massey

**9:50 a.m.** - Closing remarks

**Lunch** - at KSC Visitor's Center or in any KSC cafeteria

**Afternoon** - Employees and daughters disperse to work sites

## STS-75 crew return



STS-75 Mission Specialist Claude Nicollier and his crew members encounter a crowd of admirers at a crew return presentation April 2 at the Training Auditorium.



John F. Kennedy Space Center

## Spaceport News

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Contributions are welcome and should be submitted two weeks before publication to the Media Services Branch, PA-MSB. E-mail submissions can be sent to Barbara.Compton-1@kmail.ksc.nasa.gov

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