Space News ROUNDUP!

VOL. 36 NO. 15 | Lyndon B. Johnson Space Center, Houston, Texas | May 9, 1997

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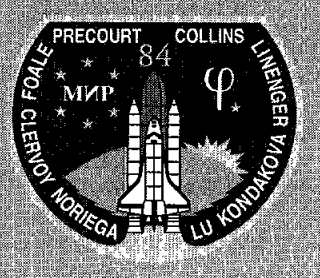

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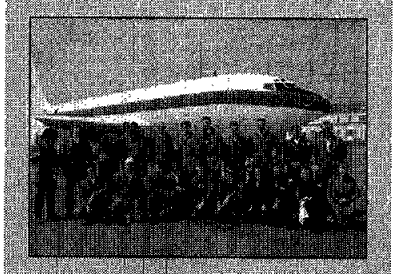

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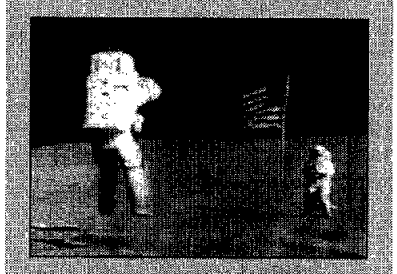

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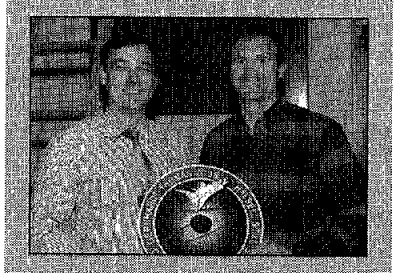

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JSC's ISO 9001 efforts mark milestone

By Leon Blum

JSC's Quality Manual for ISO 9001 is now in effect following JSC Director George Abbey's approval last month.

The approval follows months of activity and the concurrence of the JSC senior staff, and establishes policy and objectives for providing quality products and services through guidelines that document the center's quality system.

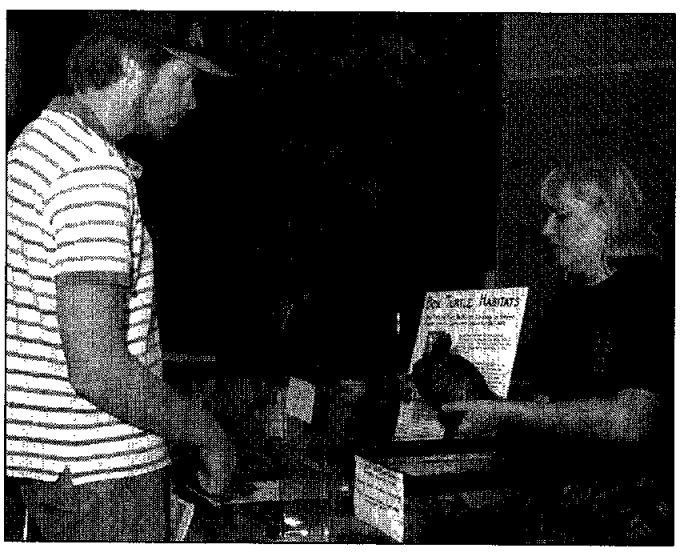
"This manual establishes a documented quality system under the control of the center director that applies to all of JSC," Abbey said in the preface of the manual. "It is based upon the International Organization for Standardization ISO 9001 standard for quality that has gained widespread acceptance around the world. Adherence to the ISO 9001 requirements involves a disciplined approach to the design, development, production, testing and flight readiness of our work elements that is entirely appropriate in our role as the world leader in human space flight. Its benefits will be measured in the quality of the work we perform and the value we provide to our constituents. I strongly endorse the implementation of ISO 9001 at JSC and its continuing use as the accepted standard for quality."

The manual and the quality system it describes apply to the JSC-owned processes required for delivery of products and services provided by JSC in support of its core business functions including program and project management, spacecraft engineering and design, flight crew training, space and life sciences research, and mission operations in support of the Human Exploration and Development of Space Enterprise. White Sands Test Facility is specifically excluded from the scope.

The quality manual is a controlled quality document that can be found on the ISO 9000 Web site at http://www4.jsc.nasa.gov/ ISO9000/

"The manual contains essential information for all JSC personnel," said Lee Norbraten, director of the ISO 9000 Office. "It includes important information including the JSC quality policy, definitions of terms, organization and structure of the quality documentation and the responsibilities of managers and employees. All employees are encouraged to read and become familiar with the requirements of the quality manual."

With the implementation of the quality manual, employees have an overall road map to follow JSC's quality policy—"to provide products and services that meet or exceed all customer requirements for safety, performance, cost and schedules."



EARTH DAY—More than 800 employees turned out for JSC's Earth Day last month at the Gilruth Center. Organizers report 674 people pledged to start or increase their recycling or conservation efforts. Top: From left, Rindy Carmichael of Hernandez Engineering helps John Ross and Ken Burko of the Texas Forestry Service give away oak, cypress and pine tress to employees. Left: Marlena Barr, right, of the Gulf Coast Turtle and Tortoise Society, shows off a turtle during the Earth Day event.

JSC Photos S97-05717, S97-05719 by Steve Candler

Linenger completes space walk

U.S. astronaut Jerry Linenger and Mir 23 Commander Vasily Tsibliev successfully conducted a five hour space walk April 29, the first joint U.S.-Russian space walk ever undertaken.

The pair attached and retrieved several experiments designed to collect data on the nature of the environment around the orbiting space complex.

Linenger and Tsibliev opened the airlock hatch on the Kvant-2 module at 12:10 a.m. CDT Tuesday and the two space walkers went right to work, testing the mobility and design of new Orlan-M space suits earmarked for eventual use in the assembly of the International Space Station.

Linenger and Tsibliev reported that new visors in the spacesuit helmets to protect them from the harsh effect of the sun worked to perfection and prevented their visors from fogging during the most strenuous periods of activity.

Linenger was congratulated by Russian ground controllers at the start of his first space walk as he and Tsibliev used a telescoping cargo crane to move themselves and their equipment from the Kvant-2 module to the Mir's Docking Module for the installation of the Optical Properties Monitor. The device, which is designed to collect data on the environment

Please see **COSMONAUT**, Page 8

Leadership 'ought to be easy,' boss says

McDonnell Douglas president kicks off Low lecture series

By Kelly Humphries

The president and chief executive officer for McDonnell Douglas Corp. told JSC managers recently that the key to leadership lies not in dominating others, but in eliciting their cooperation and freeing them to do their jobs with creativity and good judgment.

Harry Stonecipher kicked off the George M. Low Leadership Lecture series April 29 at the Gilruth Center, speaking to selected JSC managers and employees about the importance of leadership and his belief that "it ought to be easy."

"There is a huge difference between leading and commanding," said Stonecipher, who has risen through the ranks of companies becoming vice president and general manager of General Electric's aircraft engine operations and chief executive officer of Sunstrand Corp., a major aerospace manufacturer. "The best and truest leader is the one who leads with the lightest touch. As a rule of thumb, the fewer decisions you make, the more powerful and effective your organization will be."

Stonecipher began his talk, the first of what promises to be a quarterly series featuring leaders from both inside and outside the immediate NASA family, by praising its namesake as "probably the guy who really took us to the Moon" and quoting Homer and President Harry S. Truman.

Homer's heroes always become divinely inspired at crucial moments, he said, and Truman's life is a study in how a person of ordinary beginnings became a great leader only when the mantle was thrust upon him.

"We can always recognize a leader when we see one, but I've yet to really see a good definition of what leadership is all about, where it comes from," he said. "All of us can think of certain leaders, who in the midst of crisis, have seemed as though they really were larger than life. And, certainly, one of the great characteristics of leadership is persuading ordinary people to do extraordinary things."

Stonecipher said he rejects the idea that leadership is a totally exceptional quality and believes instead that it is a very human quality, one that eludes some of the brightest and most ambitious people.

"I believe that leadership, to a large degree, is a learned behavior—or at least a desired behavior—and that it is within the grasp of many, not just a few," he said. "In my experience, people who are consumed by a need for power are really the least suited of all to act in a leadership capacity. Everything in their nature conspires against the effective use of the very thing they crave. They make hard work of leadership—on themselves, and everyone around them, by being arrogant, overbearing and, at the end of the day, totally isolated. Power perceived is far more effective than power used."

Stonecipher used a Truman example to illustrate his belief that immediately demonstrating determination to lead in a certain way and in a certain direction are critically important. In each new assignment he has received, he said, he has found the first five minutes, the first five days and the first 100 days must be successful for a leader or the internal forces of inertia and active resistance to change will be too much to overcome.

The George M. Low Leadership Series, sponsored by the JSC Human Resources Office, is intended to stimulate thoughtful discussion and expand the vision of the center's leaders, JSC Director George Abbey said. It honors Low, who joined the

Please see **TAKE**, Page 8

Foale extends U.S. presence on Mir station

JSC Photo S96-17465

Astronaut Mike Foale suits up in his Soyuz spacecraft simulator during a training session at the Gagarin Cosmonaut Training Center in Star City, Russia, outside Moscow. Foale is expected to replace Jerry Linenger for a four-month stay on the Russian space station continuing America's presence in space.

By Kyle Herring

When Mike Foale crossed the Atlantic Ocean more than 15 years ago from England, he brought with him a doctorate in astrophysics and a desire to work in the American space program. That desire led to three flights on the space shuttle, most recently flying within 40 feet of the Russian Mir Space Station.

Having whetted his appetite with the STS-63 mission, Foale now prepares for a fourth space flight to finally close that distance, dock with the station and board Mir. For the last year and a half, he has lived, worked and prepared for this four month mission at the Gagarin Cosmonaut Training Center in Star City, Russia, outside Moscow. His stay aboard Mir will extend the continuous U.S. presence in space that began in March 1996 with Shannon Lucid on the STS-76 mission.

MIR-23 FOALE

Reflecting on the first shuttle rendezvous with Mir that laid the groundwork for the docking missions two years ago, Foale says that even then he saw it as something special.

"It was a very touching and emotional moment for me," he says. "I thought I was part of a very big venture—a kind of worldwide venture joining two countries together."

STS-63 was the first time the shuttle approached Mir and presented unforgettable views that Foale says he's looking forward to seeing again.

"Certainly I remember that view really clearly from when we approached the Mir and sunlight glinting off the solar arrays," he says.

Living in space for long periods means having a different outlook on what lies ahead, Foale says, because the space shuttle missions are of finite lengths. He jokingly views his trip to Mir as a "bit like a marriage."

"The wedding is exciting, but you really have to think about what is going to happen beyond that as you work through the whole mission," Foale says. "So I'm being much more calm in my attitude to what is going to happen after the hatch closes and the shuttle leaves. That's where I just learn to live, get on with my crew mates and do my duty."

As has been the case on the previous crew exchange flights with Lucid, John Blaha and Jerry Linenger, Foale expects the reunion to be an emotional one. "I'm interested to see exactly what his (Linenger's) expression will be."

Having moved several times in the last year and a half as part of his training regimen, Foale is treating this trip as just another move. "You get used to your new house and new surroundings and new people. You adapt to it," he says.

Linenger prepared for his flight to Mir by cross-country skiing at night in Star City. Foale, too, tried cross-country skiing while in Russia, "but not at night," he jokes. He did it as a general conditioning tool rather than as preparation for the Mir trip.

Coincidentally, boarding school back home in Britain helped him to deal with being away from family. "I'm used to seeing loved ones depart and being in a place that was initially feeling rather strange and foreign to me," he says.

Foale says he's not worried about systems problems experienced on the Mir during Linenger's tour.

"I think living on the Mir is certainly no worse, probably a lot less dangerous than any shuttle or Soyuz launch. By far the riskiest thing I'm doing is going out to the launch pad with my fellow crewmates on STS-84," he says. "Once you're in space, the environment is less severe in a time-critical way and I think that once you've got past the hurdle of the launch, everything else is easier, and going across to the Mir is no big transition in risk.

"One thing, I should say, that has never ceased to amaze me is every time we think something has really gone wrong in the Russian program—it's really bad—it hasn't, and we've had many, many false alarms, many scares about things being 'the end' on board the Mir. Indeed the Mir is an extraordinary spacecraft because it's lived long beyond its design lifetime, but the Russians have incredible ingenuity and resilience in maintaining that space station in a working order."

As Foale and his crew mates wrap-up training for their mission, a late addition to their logistics payload—a new Elektron unit, the oxygen generating system for the space station—has been installed in *Atlantis*' Spacehab. The four-foot-long, 300-pound unit will be the first item transferred from the shuttle to Mir and installed in the Kvant-2 module following undocking. Current plans call for the operating Elektron system now in Kvant-2 to be moved to the Kvant-1 module to be used as a back-up.

Though a space walk is not planned during his stay on Mir, Foale did conduct an extravehicular activity on STS-63 with former Astronaut Bernard Harris. As Linenger's backup, the two trained side-by-side in Star City for stays on the space station. Foale has prepared for any contingency space walk by wind surfing—a favorite hobby that he feels is good training.

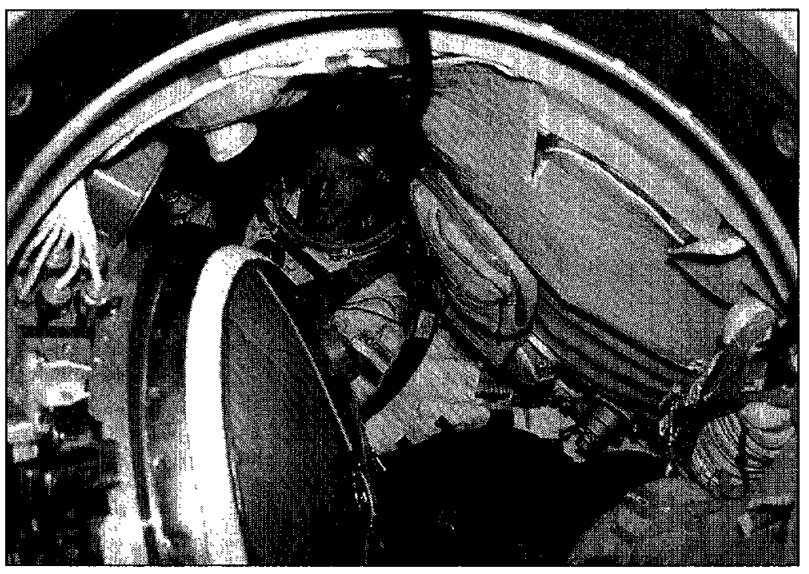
"I've always thought that the wind surfing that I do is really applicable," Foale says.

In June 1983, Foale came to JSC in payload operations as the space shuttle was about to fly its seventh mission.

It was during this time that he met and eventually married the former Rhonda Butler. He worked as a payloads officer in Mission Control for several shuttle missions prior to joining the Astronaut Corps in 1987.

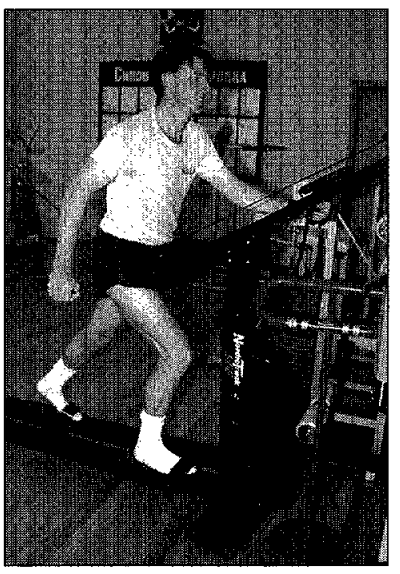
Foale has thought quite a bit about the future after his return from Mir. "Rhonda and I are great planners for anything," he says. "We've already been thinking what my attitude will be and what kind of vacation we're going to take after the flight. Will I be dying to be on a beach and have wind in my face? Probably," Foale says.

Beyond that, he says he would like to lend his language skills and knowledge of life on a station to the building of the new International Space Station scheduled to start its assembly in space next year.



JSC Photo S96-17464

Foale gets a fit check in the Soyuz capsule during training in Star City. In case of an emergency, Foale and his Russian crewmates, Mir 23 Commander Vasily Tsibliev and Flight Engineer Alexander Lazutkin, would evacuate the Mir space station in the Soyuz.



JSC Photo S96-17416

Foale exercises in the Star City gym. Workouts and cross-country skiing are conditioning tools in preparation for the Mir trip.

JSC Photo S96-17453

Foale receives a fit check of his Soyuz suit, which will be delivered to the Mir for his fourth-month stay on the Russian outpost. Foale has spent the last year and a half living and working in Star City in preparation for the STS-84 mission, scheduled to launch Thursday, May 15.

Atlantis to launch Thursday on crew exchange mission

By Kyle Herring

Atlantis is set to launch at 3:08 a.m. Houston time Thursday, May 15, to begin the sixth space shuttle mission to dock with the Russian Mir Space Station. The countdown begins Monday.

Highlighting the flight will be the swap of Astronaut Mike Foale with Jerry Linenger who has been on Mir since *Atlantis*' last visit in January. As has been the case in the previous docking missions, some 7,000 pounds of supplies will be transfered between the two spacecraft during the five days of joint operations. Foale will return home on *Atlantis*' next visit in September after swapping places with Wendy Lawrence, who is in her final months of training in Star City, Russia, in the suburbs of Moscow.

Though delayed by a couple of weeks from reaching the launch pad, *Atlantis*' processing has been smooth enough to maintain the originally planned launch date, which is precisely targeted to allow *Atlantis* to rendezvous and dock with the Mir just after 9:30 p.m. CDT May 16. With an on-time launch and docking, the five days of joint operations is scheduled to conclude with *Atlantis*' undocking from Mir about 8:45 p.m. CDT May 21.

STS-84 ATLANTIS

If all stays on schedule, the STS-84 mission should conclude with a landing back at the Kennedy Space Center on Saturday morning, May 24.

Assisting with the transport of supplies and crew members will be Commander Charlie Precourt, Pilot Eileen Collins and Mission Specialists Jean-François Clervoy, Elena Kondakova, Carlos Noriega and Ed Lu.

Noriega and Lu are flying for the first time on the shuttle. Both are members of the astronaut class of 1995. The rest of the crew has flown at least once previously. Foale is about to venture into space for the fourth time, Precourt for the third and Collins and Kondakova for the second. Kondakova has the longest time in space of the crew based on her flight as a cosmonaut crew member aboard Mir for six months.

Once docked, the hatches between *Atlantis* and Mir will be opened, the STS-84 crew will join Cosmonauts Vasily Tsibliev and Alexander Lazutkin and Linenger. The two cosmonauts launched to Mir on Feb. 10, docking two days later.

Precourt will be the first astronaut to return to Mir, having been the pilot on the first docking mission two years ago. He said opening the hatches will be "like an old homecoming for family that you haven't seen for a long time." Both crews trained together in Russia and here at JSC. They also have talked several times via ham radio.

Atlantis' mission will be the 19th for the orbiter and the 84th in shuttle program history. After the flight, the vehicle will be processed for the next docking mission, STS-86, to bring Foale home and drop Wendy Lawrence off at Mir.

Community News

Johnson Engineering 'plugs in' for learning

By Marilyn Tellier

Johnson Engineering, along with other NASA contractors nationwide, is participating in the most recent innovation in an already unique distant-learning program created by the Department of Space Studies at the University of North Dakota.

The newest addition to the program is a short course on telerobotics that is being presented jointly by UND's Department of Space Studies and NASA's Ames Research Center utilizing the latest technologies offered on the Internet. Students are able to attend classes taught real-time via the Internet while being afforded the considerable convenience of never having to leave their home or workplace.

Rodney Long, a Johnson Engineering design engineer, has taken advantage of this cutting-edge opportunity by enrolling in the course which is taught by Ames scientists and engineers. Long, who is with Johnson's Special Projects Group, is attempting to expand his knowledge base regarding robotics. He is presently working on the development of a robotic arm which is intended for use in JSC's Neutral Buoyancy Laboratory.

"The course is a valuable resource for instruction on robotic development, and has proven very useful towards the successful completion of work I am involved in," Long said.

Long attends the weekly, Internet-accessible classes via a computer in JSC's Flight Crew Support Division's Design Engineering Integration room in Bldg. 9. Once a week, after business hours, the room is reserved for JSC and contractor employees who are enrolled in the nine-week course. Johnson is covering Long's tuition fee for the course through its Employee Education Assistance Program, which is offered to employees who take job-related continuing education courses.

The University of North Dakota master's degree program in space studies, created in 1987, is the only one of its kind in the U.S and is aimed at those who are seeking to enter the space studies field as well as aerospace professionals who may wish to expand on their existing knowledge. In January of 1996, the decision was made to go on-line with the program. In the 16 months that the distant-learning program has been made available there has been increasing interest raised, to date, students from more than 30 states and seven countries have enrolled in the program.

"Most enrolled students are married, well-established in space-related occupations, and seeking to advance themselves in their chosen careers," said Dr. Charles Wood, chairman of the program. "For these students, moving to North Dakota for the two years necessary to attain their masters degree in space studies is just not feasible or convenient. Enter remote-learning to the rescue. Now it doesn't matter where you live or work, you can still attain a degree. And for those students who prefer to be educated in a more traditional manner (and are willing to brave the North Dakota winters), they are more than welcome to physically attend the university."

Wood, and his colleague, Dr. Steven Williams, assistant professor of space studies, share in promoting, facilitating and conducting the program. Both of these scientist/educators teach, advise students, conduct research and otherwise support their department and university.

On a recent trip to Houston to attend the 28th annual Lunar and Planetary Science Conference, hosted by the Lunar and Planetary Institute in conjunction with JSC, Wood and Williams met with Johnson Engineering President Tom Short to discuss the university's space studies degree program in greater detail. Wood described the program as a way of combining scientific, technical, medical, political and legal aspects of exploration and development of space into one all-encompassing degree program.

"Students in the program can focus on such areas as planetary science, global change, space law and commercialization," Wood said. "Most students enrolled in the masters program are not engineers or going into engineering. Rather, they are employed in other fields of science, or other disciplines such as business or communications."

Interactive sessions are offered in a way that accommodates students worldwide. U.S. students are offered courses in the evening, the most convenient time for students who work full time. Noon courses are conducted at the university and are translated into evening classes for European students and into morning classes for Asian students.

In the future, more one-credit seminar courses similar to the one in telerobotics may be offered. Image processing is one such course under consideration. The university also is looking at incorporating technical improvements such as live video and audio and on-line simulations, some of which are being tested during this present course in telerobotics.

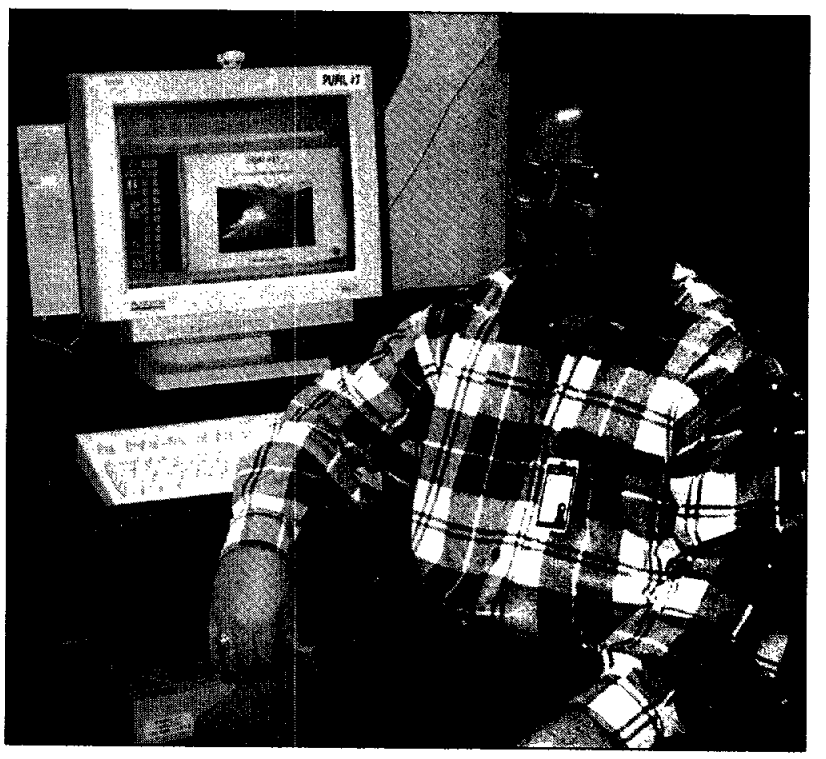


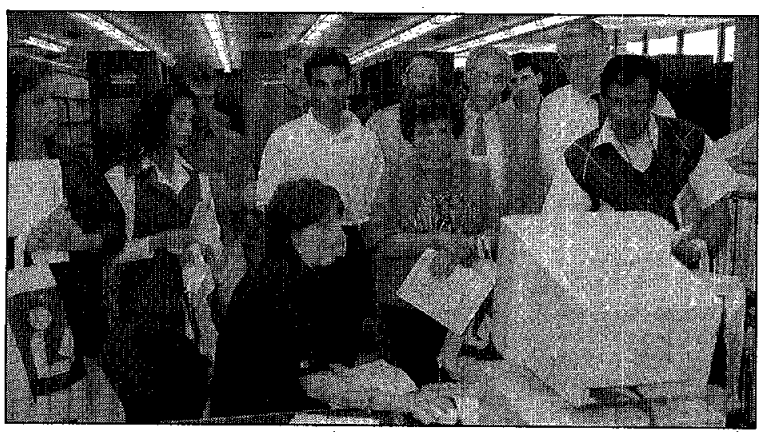
Photo courtesy Johnson Engineering

Rodney Long, a Johnson Engineering design engineer, attends a telerobotics course via the Internet offered by the Department of Space Studies at the University of North Dakota.

Wood said the SPACE.EDU website acts as a virtual campus for the distant-learning students, offering them access to campus facilities on an equal level to those available to students who physically attend the university.

"Students can interact with instructors, take exams, turn in assignments and acquire information from the library," Wood said. "Students have no excuse for missing classes since they are able to log-on from anywhere-even their hotel rooms while on travel."

To be admitted into the masters program, a candidate must possess a bachelor's degree in any of the following disciplines: engineering, science, business, social science, communication or information systems. For more information regarding admission requirements or the space studies program in general, visit the university's web site at http//www.space.edu/ or contact the Department of Space Studies directly at 1-800-828-4274.



JSC Photos S97-05604, S97-05603 by Steve Candler

OPEN HOUSE—Organizers say the Scientific and Technical Information Center Open House, held April 15, was a resounding success, with more than 600 employees attending throughout the day. The 30 plus demonstrations and tours were attended by an average of 10 people each. The center received more than 300 surveys with positive comments. Participants said they appreciated the variety in the schedules, learned from the systems demonstrations and heartily support having an open house annually. Library staff already have received requests from several organizations across site for custom training and instruction.

The following employees won their choice of a book by filling out JSC Form 1621, which registered them for borrowing privileges at the library: John Jackson, Mary Wilkerson, Melissa Perret, Larry Shaw, Rebella Mraz, Joseph Yeo, William Readdy, Silvia Stewart, Tom Conger, Bashir Syed, George Fletcher, Robert Rose, Karen Clark, Ellen Hill, Terri Schneider, Randal Sharon Killough, Jacque Myrann, Sharon Lafuse, Chin Lin, Steven King, Dell Avery, Anna Lyon and Steven Jaeger.

Samantha Nichols and Chris Monk won an autographed copy of the book "Orbit" by Astronaut Jay Apt.

Winners of the library scavenger hunt also received a autographed copy of Orbit. Winners were: first place, Karen Frank; second place, Richard Gilbert; and third place, tie between Katie Hamilton, Chris Shannon and Trinese McKenzie.

Above: Sharon Halprin shows open house visitors how to use the vast computer resources located in the library. Below: Employees "sign up" to obtain library borrowing privileges.

JSC clinic offers blood pressure screenings to employees during May

The JSC Clinic will be offering blood pressure screening during May and employees may have their pressure screened in several locations.

On Monday, May 19, the clinic staff will conduct screenings from 8:30-11:30 a.m. at Bldg. 30; 1-2:30 p.m. at Bldg. 4 South and from 2:45-3 p.m. at Bldg. 32.

On Tuesday, May 20, the staff will conduct screenings from 8:30-11:30 a.m. at Bldg. 1; 1-2 p.m. at Bldg. 7; and from 2:45-3:45 p.m. at Bldg. 15.

On Wednesday, May 21, the staff will conduct screenings from 8:30-11:30 a.m. at Bldg. 45; from 1-2 p.m. at Bldg. 16 and from 2:45-3:45 p.m. at Bldg. 31.

On Thursday, May 22, screenings will be given from 8:30-9:45 a.m. at Bldg. 44; 10-11:30 a.m. at Bldg. 419; 1-2 p.m. at Bldg. 37 and 2:15-3:45 p.m. at Bldg. 325.

On Friday, May 23, the staff will conduct screenings from 8:30-9:30 a.m. at Bldg. 225; from 10-11 a.m. at Bldg. 372 at Ellington Field; and from 1-2 p.m. at Bldg. 17.

total health

Employees are encouraged to have their blood pressure checked to prevent heart disease. Medical scientists have determined a normal range for blood pressure and people whose pressure is consistently higher than normal have high blood pressure or hypertension. High blood pressure causes the heart to become enlarged, can scar the arteries and can form blood clots. All of these can lead to heart failure. For more information on the screenings call the clinic at x34111.

JSC Safety Alert

Reduce Your Unintentional Exposure To Hazardous Materials

What happened

Seven gallons of three products were purchased and then used in Bldg. 9 South without Material Safety Data Sheets (MSDS) being available for these products. The lack of MSDSs was discovered while processing the material for disposal.

Outcome of the Investigation

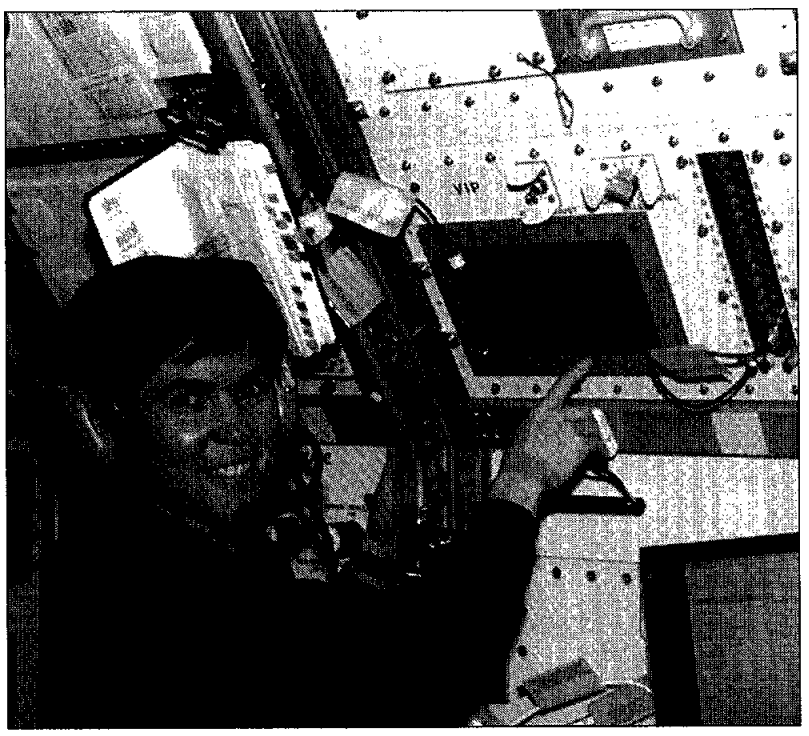
A product, without an MSDS, may enter the workplace several ways: through normal logistics channels; by delivery of a material to a JSC bond room; by vendors supplying samples for testing; by individual employees bringing the material to the workplace; and by an off-site contractor bringing materials on-site.

What You Can Do

- Be familiar with both Chapter 601, "Hazardous Materials Safety and Health" and 602, "Hazard Communication" of JPG 1700.1G, JSC Requirements Handbook for Safety, Health, and Environmental Protection;
- Attend the Hazard Communication training for JSC;
- Look for materials without labels or MSDSs during your scheduled safety walk-throughs;
- Follow the instructions on the labels and MSDSs to protect yourself as well as your fellow employees; and
- Report chemicals, materials, or products without labels or MSDSs to your immediate supervisor, safety representative or Facility Manager.

DO NOT work with a chemical, material, or product that does not have a label and an MSDS.

A copy of any MSDS in your work area must be sent to the JSC Central Repository (SD23). Check JSC MSDS numbers. If you don't have one, contact Margaret Mundine at x37512 for assistance.



JSC Photo STS83-305-017

Payload Commander Janice Voss displays a pleasant countenance following a successful test at the Combustion Module-1. The test was designed to study the structures of flame balls at low Lewis numbers. The CM-1 facility accommodates a number of experiments using different chamber inserts.

JSC Photo STS83-325-004

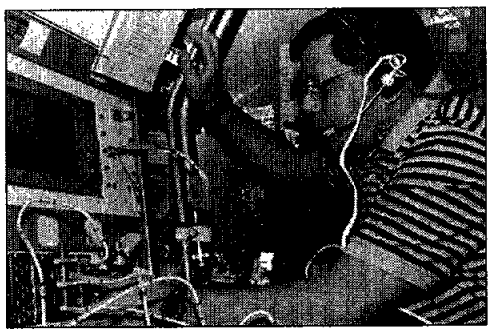
The STS-83 crew poses for the traditional inflight portrait during a Microgravity Science Laboratory shift changeover in the Spacelab Module aboard *Columbia*. Front row from the left are Payload Commander Janice Voss, Commander Jim Halsell and Mission Specialist Don Thomas. Back row from left are Payload Specialist Roger Crouch, Mission Specialist Mike Gernhardt, Pilot Susan Still and Payload Specialist Greg Linteris.

Short Stay

The STS-83 crew returned 12 days early from its flight but was able to capture some memorable moments.

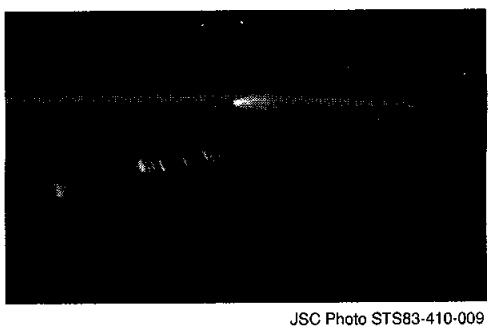
JSC Photo STS83-312-031

From left, Linteris works at the Mid Deck Glove Box, while Thomas works at the Expedite the Processing of Experiments to Space Station rack. MGBX is a facility that allows scientists to test hardware and materials that are not approved to be handled in the open Spacelab. It is equipped with photographic, video and data recording capability, allowing a complete record of experiment operations. Experiments performed on STS-83 were Bubble Drop Nonlinear Dynamics and Fiber Supported Droplet Combustion. On the opposite side of Spacehab, EXPRESS is designed to provide accommodations for Sub-rack payloads on space station. For STS-83, it held two payloads, the Physics of Hard Colloidal Spheres and ASTRO-Plant Generic Bioprocessing Apparatus, a facility with light and atmospheric controls that supports plant growth for commercial research.



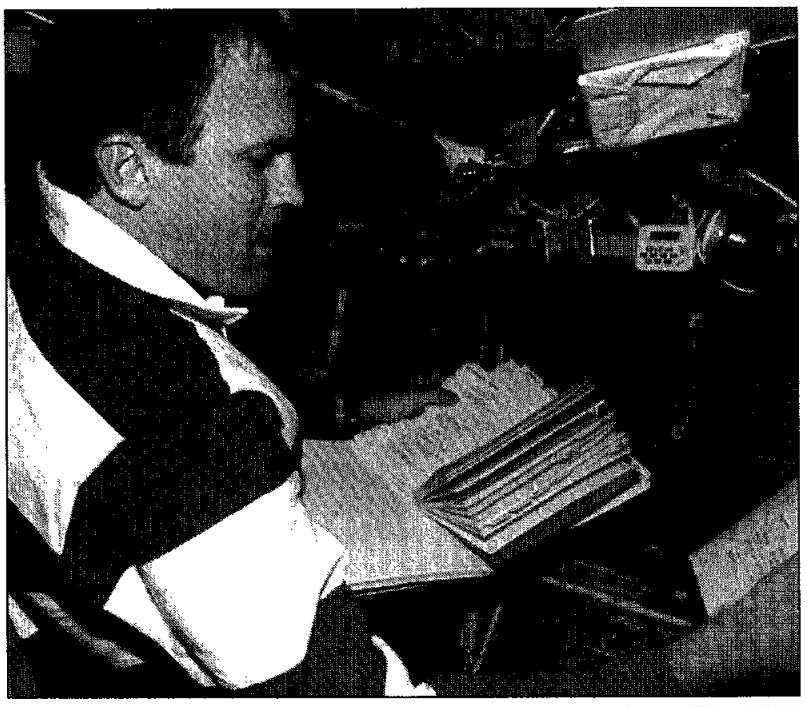
JSC Photo STS83-346-024

Crouch performs the activation for the Mid Deck Glove Box. Made to accommodate a variety of hardware and materials testing, the facility offers physical isolation and a negative air pressure environment so that items not suitable for handling in the open Spacelab can be protected.



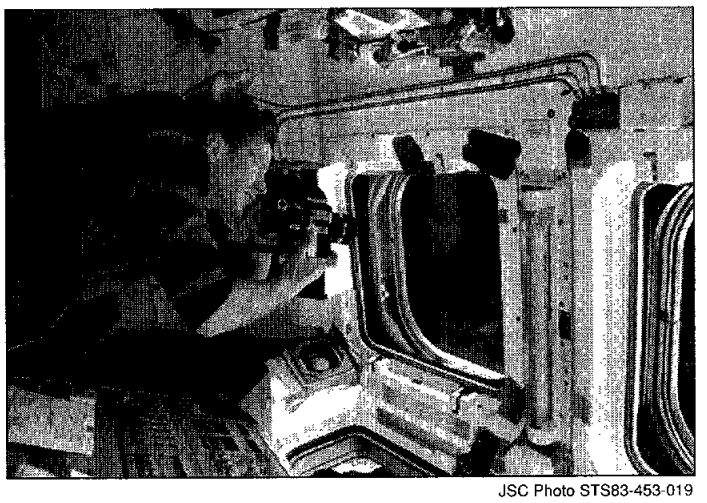
JSC Photo STS83-410-009

A 35mm camera records this time-exposed image of Comet Hale-Bopp at sunset. Note that stars show up in this image because of the more lengthy exposure time, whereas the celestial features do not show in the majority of space shuttle pictures focused on Earth and its horizon. As another spin-off of the more lengthy time exposure, city lights and petroleum fires are seen as distorted streaks.



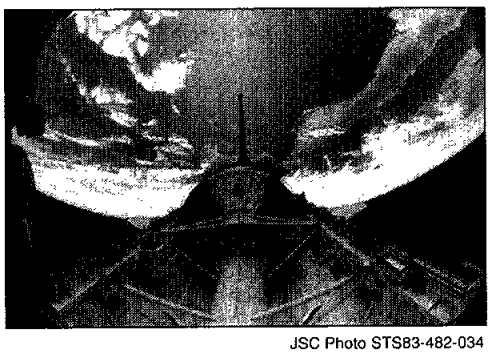
JSC Photo STS83-450-012

Halsell mans the commander's station aboard *Columbia*. Designed as a 16-day Microgravity Science Laboratory mission, the flight was cut short when ground controllers received indications that one of three fuel cells did not function properly.



JSC Photo STS83-453-019

Gernhardt uses a hand-held 70mm camera to record images of Earth through the overhead windows on the aft flight deck of *Columbia*.

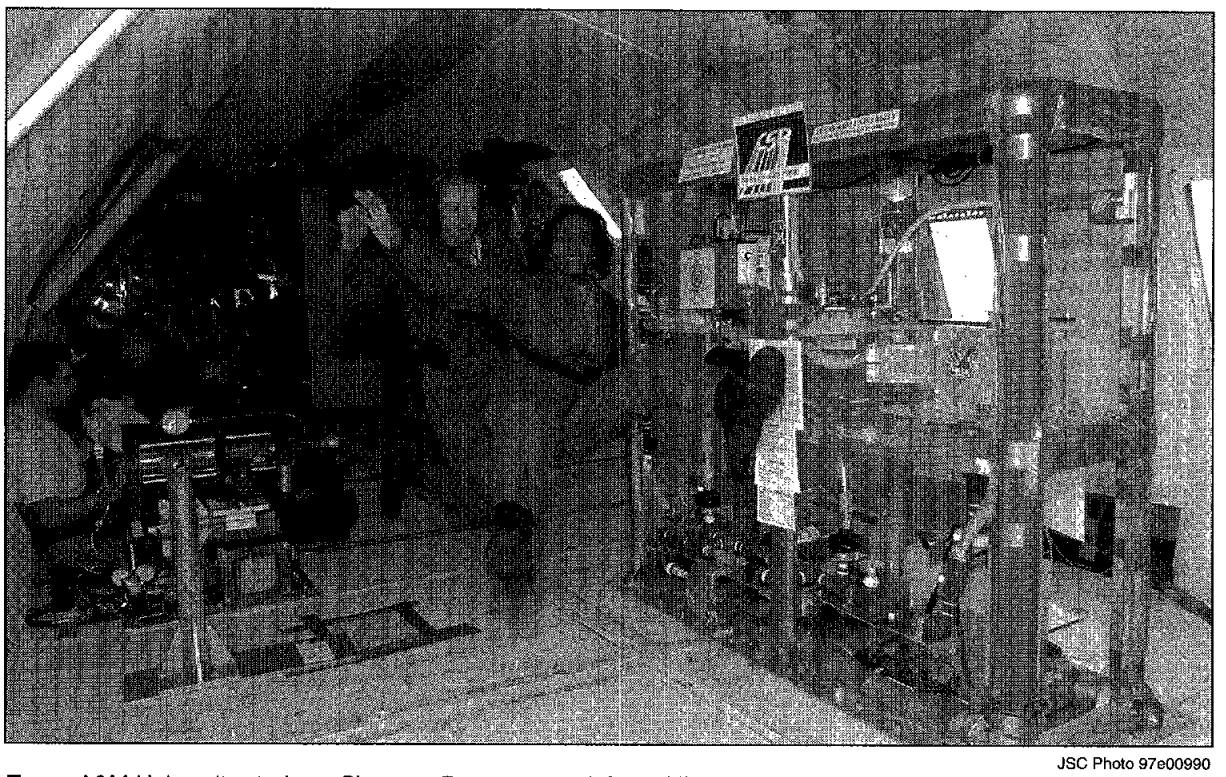


JSC Photo STS83-482-034

A special lens on a 35mm camera gives a "fish-eye" effect of the Spacelab Module back dropped over the Pacific Ocean. Nearly all of Baja Calif., and part of western Mexico can be seen at left.

JSC Photo STS83-83-303-002

Still floats into the Spacelab module in the early phases of its activation. Still, a member of the 1995 astronaut class, joined four other NASA astronauts and two scientist payload specialists for the Microgravity Science Laboratory mission aboard the Earth-orbiting *Columbia*.

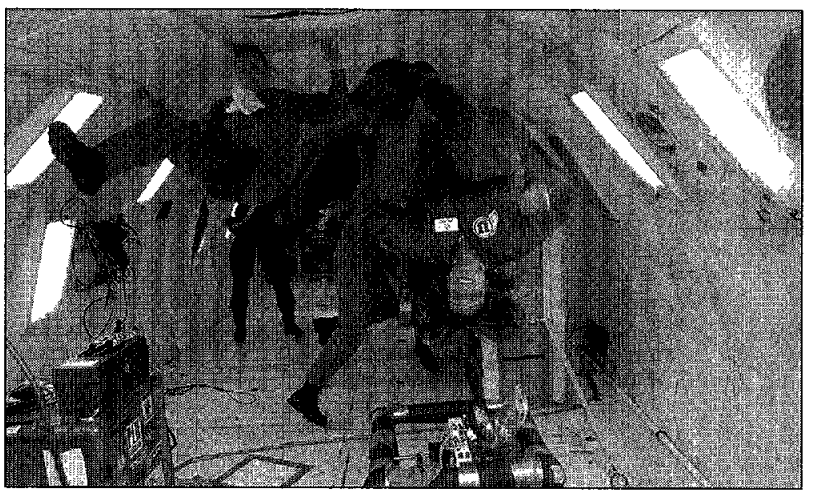


JSC Photo 97e00990

Texas A&M University students Shannon Bragg, center left, and DeLeah Lockridge, center right, fly with their experiment, the Microgravity Phase Separation in a Fixed Cylinder, that examined how gases separate in microgravity. A two phase system could provide improved operation and efficiency compared with analogous single phase systems currently in use, thus reducing power requirements and mission costs.

Weightless Wonders

KC-135 student flight phase ends, outreach activities begin



JSC Photo 97e00976

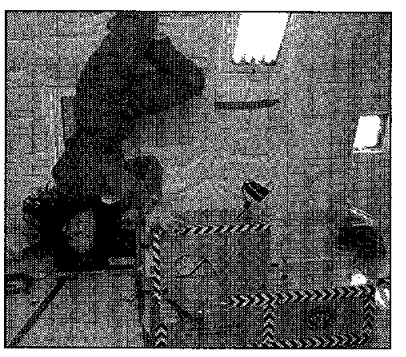
University of Utah students Darren Kimoto and Lisa Book fly with a physical model of the cardiovascular system to examine the reduction in stroke volume inside the heart's ventricles.

JSC Photo 97-04906

From left, KC-135 Test Director Judy Rickard answers questions from JSC Assistant Director, Technical Tom Akers and JSC Director George Abbey about the students experiments.

JSC Photo 97e01036:

Facing the camera, from left, the University of Texas at Austin student Jessica Regner, Jim Wilson, Texas Space Grant Consortium, program manager and UT student Daniel Luna keep an eye on the Quark Search experiment. This experiment is trying to determine whether or not it is feasible to place small metal spheres in microgravity and test for fractional charging.



JSC Photo 97e01009

Crystal Embry of Rochester Institute of Technology observes and records the distribution of liquid in a zero gravity environment during the process of rupturing a balloon. This experiment examined how different liquids respond to the disintegration of the rubber shell.

JSC Photos by Robert Markowitz and Hector Gongora

JSC Photo 97e01031

Students from the University of Texas at Austin, Embry-Riddle Aeronautical University, University of Washington, Utah State University/Shoshone-Bannock School, Louisiana State University and Pomona College assemble for a group photo after the final flight of the program.

By Donn Sickorez

After five days of flight training, and six straight days of flying parabolas, the flight phase of the summer 1997 NASA Reduced Gravity Student Experiment Program is complete.

Friends, relatives, team members and others crowded around the aircraft April 19 to welcome the last group of new fliers home and swap tales of weightlessness and experiment performance.

The program was created to provide professional growth, technical challenges and outreach opportunities to U.S. students from colleges and universities. They came from as near as Texas A&M and as far as Michigan and Oregon and converged on Ellington Field's hangar 990 in mid-April to experience what was, for many, the highlight of their educational experience.

Twenty-three teams of students (together with their team journalists) flew experiments aboard the KC-135 microgravity-simulating aircraft. All experiments generated useful data—sometimes to the amazement of the fliers—and that data will be reduced, analyzed and translated into useful products in the months ahead.

The flight phase—a collaboration among Ellington's Reduced-Gravity Office, JSC's Education and Outreach Branch, and the Texas Space Grant Consortium—was an unqualified success for the student fliers. Shannon Bragg, a senior at Texas A&M University, echoed the sentiments of all of the fliers when she said that participating in the program allowed her and her team to experience all aspects of research.

"This is a program that I think should be continued," Bragg wrote. "The experience was amazing and I wouldn't trade it for the world and I'd jump at the chance to do it again. I learned an incredible amount about engineering in the real world as well. Designing projects on paper are one thing, putting one together is a different story. I ran into all kinds of issues—obtaining funds, working with suppliers, difficulties with my teammates, varying 'work ethics' and priorities of group members, etc. Things don't go quite as smoothly as one would hope. I put an inordinate amount of time into getting this project ready, but it was really worth it. I just consider the practical experience I gained—I have highly recommended the program to my colleagues."

Andrew Davidhazy of the Rochester Institute of Technology's was one of the students' mentors.

"The purpose of our experiment was not so much to add significant new knowledge to the scientific database but rather to solve a difficult engineering problem and to learn how one goes about solving the various technical, environmental and scientific problems one encounters along the way," he said. "One does not often get a chance to attempt to solve difficult problems under unusual conditions. This was our chance. In a way, a project like this allows its participants to stretch their minds and exercise their imagination, educational preparation and innovative thinking so that one is better able to solve yet unforeseen problems in the future."

"This experience excited me even more about research and showed me that I wouldn't be stuck in a classroom for the rest of my life," said Jodi James of Hope College. "I am intrigued about the health concerns for space travel and want to work on finding answers and solving those problems. If anything this experience inspired me and motivated me to work even harder in academia."

Program focus is now shifting to the outreach phase, which benefits wider audiences—both students and the general public. Already, outreach activities have begun.

"The interest here this week is amazing," wrote Suzanne Smith, faculty mentor from the University of Kentucky last month. "The UK paper did a half-page cover story with the photos NASA had on the FTP (File Transfer Protocol) site on Tuesday. Our four-part TV news series runs tonight and tomorrow, but there were two preliminary stories that aired yesterday. With CNN and Discovery stories running and other activities here we are really getting quite a bit of good attention. I hope we can build on that in my program and the college."

"The fliers came back heroes to everyone on the reservation," said Ed Galindo, mentor of the Utah State/Shoshone-Bannock team from Idaho. "So many people from the community and the reservation school asked for a presentation that we are scheduling a general assembly at the reservation school next Tuesday, to try to accommodate some of the requests."

Galindo added that such heroes are important to the elementary students because they contradict stereotypes of Native Americans.

"For the first time in some of these young students' lives," Galindo said. "They are face-to-face with Native Americans who are successful in science and math. It's the beginning of the realization that they can be successful, too."

Lila Engle from Northern Arizona University expressed gratitude to Burke Fort, program manager for the Texas Space Grant Consortium; JSC Director George Abbey; Bob Williams and Judy Rickard, KC-135 test directors; Donn Sickorez, JSC's university affairs officer; and Jo Anne Banks, administrative assistant at Ellington Field.

"Thank you," said Engle. "To Burke for designing the opportunity, to Bob and Judy for your outstanding patience, to Donn for a wealth of information and to Mr. Abbey for opening JSC to an unruly bunch of students. Thank you to the staff of JSC/Ellington Field. You're wonderful. And thank you Jo Anne for keeping it all running smoothly."

Results from this program will be linked to http://www.tsgc.utexas.edu/tsgc/floatn.html ❑

25 Years Ago at MSC

Apollo 16 home after busy trip

[Edited from the Space News Roundup April 28, 1970.]

Despite being cut one day short, Apollo 16 ended as gloriously as it started.

Its legacy is a wealth of scientific data that will tell man more about his very beginnings, perhaps something about his future.

Astronauts John Young, Thomas Mattingly and Charles Duke accomplished almost everything they set out to do even though they lost about 24 hours from their flight plan.

The change in schedule was made in deference to a potentially faulty thrust vector control system on the service propulsion engine - the rocket needed for the trip home.

Because he experienced oscillations in the engine as he checked it out, Mattingly called off the burn that would circularize his orbit at about 70 miles.

While he worked alone in the command module "Casper," Young and Duke lent moral support in the separated lunar module "Orion."

The "go" for landing came almost six hours late, but the touchdown on the dusty, block-strewn Descartes was perfect.

"Old Orion is finally here, Houston." Duke exclaimed at 8:23 p.m. CST April 20.

The journey to Descartes started more than four days earlier. Liftoff from Pad A at the Kennedy Space Center in Florida was right on time —11:54 a.m. Sunday April 16, 1972.

A little more than two and a half hours later, the crew performed the translunar injection burn that headed them toward the moon.

Paint flaking from the ascent stage of Orion, a lockup in Casper's navigation system and a balky steerable antenna on Orion were other pesky difficulties encountered before landing, but they proved far less worrisome than the thrust vector control situation.

But, once on the surface, Young and Duke turned their attention to exploration.

The first extravehicular activity, during which the lunar roving vehicle was assembled, the Apollo lunar surface experiments package (ALSEP) deployed, the U.S. flag raised and the solar wind composition experiments erected, lasted 7 hours and 11 minutes.

The rover logged 4.2 kilometers of lunar travel, and the explorers collected 41 pounds of rock and dust samples.

EVA Two lasted 12 minutes longer that the first, and sample weight was exactly double. Rover travel was 11.5 kilometers.

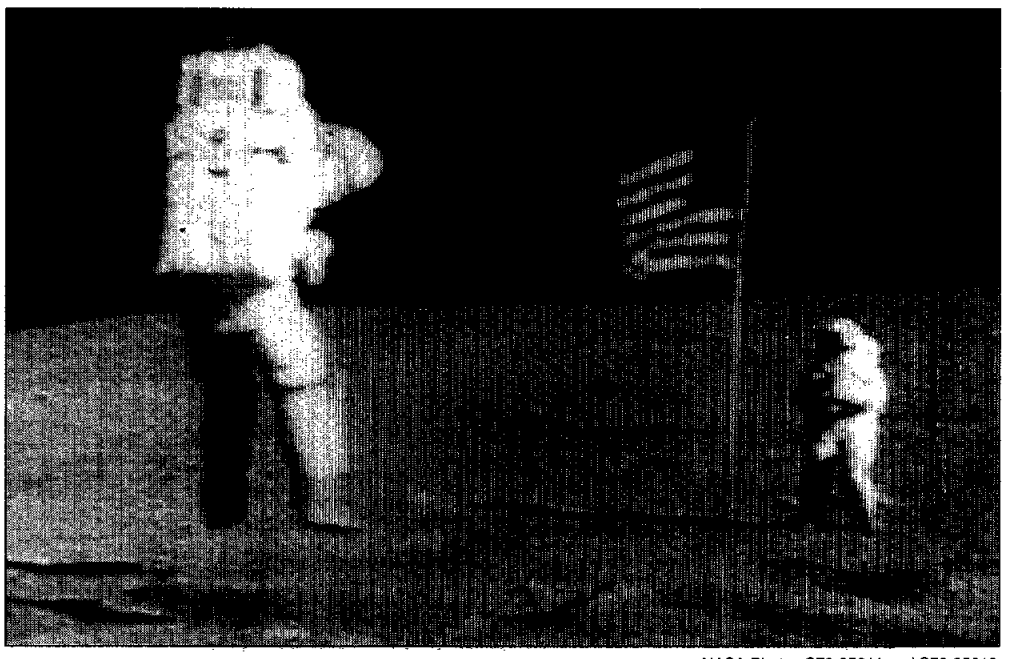
Young picked up a rock and made Earth-bound scientists perk up with "This is the first one I've seen I really believe is crystalline."

The pair also scooped up a special sample from under a lunar boulder.

The third and final surface exploration was the shortest—5 hours and 40 minutes—but perhaps the most spectacular.

When they reached North Ray Crater, Young and Duke found it an awesome sight, three-quarters of a mile across and more than 200 yards deep, the general vicinity spotted with massive boulders.

Collected samples weighed about 90 pounds, bringing the three-day total to 212 to 214. Distance covered in the rover totaled 27.1 kilometers, about 16.8 miles. And time on the three EVAs added up to 20 hours 14 minutes.



NASA Photos S72-35611 and S72-35610

Above: Casper's passengers were as happy to get home as "Jumping Jack" Young was to get to the Moon. Center: Young sets up the lunar portable magnetometer during the first of three lunar extravehicular activities.

Mattingly was equally busy with his mapping.

After lunar liftoff, televised by the remotely controlled camera on the rover, and rendezvous and docking with the command module, Mattingly reported that "morale around here just went up a couple hundred per cent."

Apparently the thrust vector control problem had not been forgotten.

Apollo 16 headed home at 8:27 Monday evening. When the craft rounded the moon and radio contact was reestablished, Orion was turned loose. It immediately started a slow tumbling. The trouble was an improperly positioned circuit breaker. Without attitude control, the LM ascent stage could not be impacted onto the moon as planned. It is expected to fall from orbit on its own in about 200 days.

The subsatellite, with its scientific equipment, was injected into lunar orbit, but no radio contact could be made with it since its frequency was the same as the lunar module.

On the homeward leg, Mattingly got his own chance to conduct an EVA. He spent a bit more than an hour outside, retrieving film from the scientific instrument module and activating the microbial response experiment.

With splashdown in the Pacific some 175 miles southeast of Christmas Island, Apollo 16 became history. Only one manned flight to the moon remains on the schedule.

Gilruth Center News

New Hours: The Gilruth Center will now remain open until 2 p.m. Saturday and close at 9 p.m. Friday.

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

Volleyball, Basketball: Registration is currently being accepted for the summer leagues.

Softball: Registration is under way for men's double-header softball league. Cost is $275 per team for a six to seven week season.

NASA Fitness Challenge: runs through Aug. 31. Call x30301 for more information.

Complete Weight Control Program: starts June 24 with sessions on Monday, Wednesday and Friday. For more information call x30301 or x30302.

Hatha Yoga: A stress relieving, stretching and breathing exercise routine to unite body, mind and spirit. Classes meet from 5:30-6:30 p.m. Thursdays. Cost is $40 for eight weeks.

Nutrition intervention program: A six-week program to learn more about the role diet and nutrition play in health, including lectures, private consultations with a dietitian and blood analysis. Program is open to all employees, contractors and spouses. For more information call Tammie Shaw at x32980.

Defensive driving: One-day course is offered once a month. Pre-registration is required. Cost is $25.

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

Weight safety: Required course for employees wishing to use the weight room will be offered from 8-9:30 p.m. May 22. Pre-registration is required. Cost is $5. Annual weight room use fee is $90. Additional family members are $50.

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

Aikido: Martial arts class meets from 5:15-6:15 p.m. Tuesday and Wednesday. Cost is $35 per month. New classes begin the first of each month.

Aerobics: Classes meet from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is $32 for eight weeks.

Ballroom dancing: Beginner classes meet from 7-8:15 p.m. Thursdays. Intermediate and advanced classes meet from 8:15-9:30 p.m. Cost is $60 per couple.

Country and western dancing: Beginner class meets 7-8:30 p.m. Monday. Advanced class meets 8:30-10 p.m. Monday. Cost is $20 per couple.

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

Gilruth Home Page: Check out all activities at the Gilruth online at: http://www4.jsc.nasa.gov/ah/exceaa/Gilruth/Gilruth.htm

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Store from 10 a.m.-2 p.m. Monday-Thursday and 9 a.m.-3 p.m. Friday. For more information, call x35350 or x30990.

Houston Astros Baseball: Field box seats $18. Astros vs. Chicago Cubs 7 p.m. June 21. Purchase tickets by June 13. Astros vs. Cleveland Indians 7 p.m. July 2. Purchase tickets by June 23.

EAA cruises: Seven-day cruise to Alaska for $1,294 per person May 23-31 or June 20-28. Seven-day cruise to Caribbean leaving from Houston in November. Prices vary depending on cabin choices. For more information call Dick McMinimy at x34037.

Astroworld: Early bird tickets are $18.25 and must be used by May 31. Season pass $56.75.

Moody Gardens: Tickets are $9.50 for 2 of 3 events.

Space Center Houston: Adult $8.95; children (4-11) $6.40.

Seaworld: Adult $27.25; $18.25 children(3-11).

Schlitterbahn: Tickets are $20.25 for adults, $17.50 for children.

Splashtown: Early bird tickets are $11.50.

Movie discounts: General Cinema, $4.75; AMC Theater, $4.50; Sony Loew's Theater, $4.75.

JSC logo shirts: Polo style, $23. T-shirt, $10.

Stamps: Book of 20, $6.40.

Orbit: The book "Orbit" by Jay Apt, Mike Helfert and Justin Wilkinson is on sale for $28.

Metro tickets: Passes, books and single tickets available.

Summer leagues now forming

The Gilruth Center is now accepting registration for summer leagues in basketball and volleyball and forming a double header league in men's softball.

Employees have the opportunity to play basketball in men's C on Monday or Thursday, men's B on Tuesday or over 35 on Wednesday. Cost is $315 per team and must be paid at the time of sign up. The Gilruth Center requires two or more players to have Employee Activities Association badges or blue outside player badges in their possession at all times. Registration ends May 14.

Volleyball leagues also are forming for summer play. Employees may play volleyball in mixed B on Monday; mixed C on Tuesday; women's on Wednesday; or men's on Thursday. Registration fee is $175 per team and must be paid at the time of registration. Volleyball leagues also require EAA badges. Registration ends May 17.

In addition to the summer leagues, a men's double-header softball league also is forming and will play on Monday and Thursday. Registration will close once the league has enough teams. The season will run for about six to seven weeks. The team with the best win loss record will receive T-shirts. Existing teams in other leagues are eligible for this league. The Gilruth Center requires five or more players to have Employee Activities Association badges in their possession at all times. Registration fee is $275.

For more information on these leagues, call the Gilruth at x33345.

Next blood drive set for June

The next JSC Onsite Blood Drive is set for June 3 and 4 and employees are encouraged to give the gift of life.

Employees wishing to donate blood can visit the Teague Auditorium lobby anytime between 7:30 a.m. and 3:30 p.m. on June 3, including lunch time, or 8 a.m. until noon on June 4. Appointments are only necessary if employees plan on donating platelets or plasma, but no appointments are necessary for whole blood donations.

Generally, donors can give blood every eight weeks. In some cases a donor may be deferred if, for example, their blood is low in iron or they've been on certain medications. If prospective donors have questions about how a medical condition may affect their ability to give blood they can call St. Luke's Blood Donor Center at 791-4483.

Under the St. Luke's agreement with NASA and contractors, the hospital provides blood assurance coverage for all JSC personnel and their immediate families. Coverage includes all fees associated with blood products for blood transfused in any Houston area hospital. Immediate family is considered to be the spouse of an employee, any dependent children and parents of an employee and spouse.

"The JSC Blood Drive Program and St. Luke's Episcopal Hospital would like to thank those of you who have taken the time to donate blood during the past year," said Dan Mangieri, coordinator for the drive. "There is no substitute for human blood, and a sufficient, safe supply is vital to the well-being of JSC employees, Houston and our surrounding communities.

"Since we've expanded the hours for donors to give blood, and changed the location of the event to the Teague Auditorium, we've held four blood drives. During that time we've had a total of 1,503 blood donations. In comparison, during the four blood drives in the same period of the prior year, the center drew only 334 donations. The JSC on-site blood drive has become a huge success as a result of your generosity. We look forward to your continued support," Mangieri said.

For more information about the JSC on-site blood drive call Mangieri at x33003.

Entire team pulls together

Fuel cell tiger team hangs STS-83 plaque

Lead Flight Director Rob Kelso congratulated everyone involved with the STS-83 mission and praised their commitment to flight safety during the traditional plaque hanging in Mission Control.

"What we recognize through this plaque hanging is the remarkable process within manned spaceflight of managing risk," Kelso said. "Everyone within the program... from the flight crew, to flight controllers, to system engineers, to factory suppliers are risk managers. STS-83 demonstrated the ability of this team to effectively manage risk toward ensuring the safety of the crew and *Columbia* when faced with a fuel cell problem that was not well understood."

After a successful landing of *Columbia* at the Kennedy Space Center, the STS-83 Fuel Cell Anomaly Tiger Team was selected to hang the plaque. While the mission team was headed by Howard Wagner, NASA Fuel cell subsystem manager, and Doug White, USA engineering, both were out of town investigating the fuel cell during the ceremony and Ray Miessler, lead for the STS-83 Electrical Generation and Illumination team, and Ray Gonzales of the Engineering Directorate were chosen to represent the team.

The STS-83 mission made it's mark as the heaviest landing to date. The mission is scheduled to be reflown in July as STS-94.

JSC Photo s90-05600 by Steve Candler

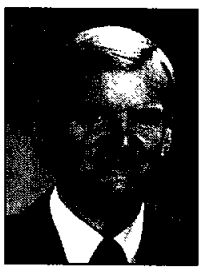
STS-83 Commander Jim Halsell, right, congratulates Ray Miessler, lead for the STS-83 Electrical Generation and Illumination team that hung the STS-83 plaque in Mission Control.

Manager's Message

By John Casper
Director, Safety, Reliability and Quality Assurance

It happens—a near disaster. And, it wasn't your fault, but it leaves you with a moist brow and clammy hands just thinking of the "what ifs?" This was the experience of an on-site driver on the clear Tuesday morning of April 29.

Stopped at a red light at the corner of 2nd Street and Avenue C, the driver waited until the light turned green. Then, moving forward with the signal, he looked in stunned disbelief as a bicycle rider whizzed up from the right side and turned left, directly across the car's path. Adrenaline took over. The brakes were slammed, missing the rider by a heart-stopping six inches, and a near tragedy was averted. Serious injury? Probably. Death? Very possibly. You see, in addition to riding carelessly, the cyclist was not wearing a helmet.



Casper

The bicycle rider kept going.

A close call? Yes. Was anything learned from this? Will the rider be more cautious in the future? Does the rider even observe JSC regulations?

If you ride a private or government bicycle or a motorcycle, you must follow these requirements in addition to JSC traffic rules:

- Wear a helmet;
- Wear appropriate clothes. Avoid anything that could catch on the chain or on any road obstacles. Flat-soled shoes are recommended;
- Avoid riding on sidewalks if possible;
- Limit your speed; and
- Yield to pedestrians at all times. Warn pedestrians before you pass them.

The JSC Vehicle Code imposes bicycle and motor-assisted bicycle rules.

We would like to think the incident described is a rarity—that it won't happen again. But it can. Next time, carelessness may not get a second chance.

People on the Move

Human Resources reports the following personnel changes as of March 30:

New Hires

Karla Washington was hired as a program analyst in the Business Management Directorate.

Loretta McDonald was hired as an aerospace technician in Mission Operations.

Raul Blanco was hired as an aerospace technician in Engineering.

Temporaries

Beverly Calvert joins the International Space Station Program Office.

Promotions

Carol Hill was recently promoted to secretary in the Business Management Directorate.

Gregory Oliver and Debbie Pawkett were promoted to supervisory aerospace technicians in Mission Operations.

Susan Anderson was promoted to administrative assistant in Engineering.

John Bacon, Susan Burns, David Petri and Ted Tsai were promoted to aerospace technicians in Engineering.

Steve Poulos was promoted to supervisory aerospace technician in Engineering.

Estrella Jones and Maria Perez were promoted to accounting technicians in the Office of the Chief Financial Officer.

Kevin Window was promoted to aerospace technician in the International Space Station Program Office.

Retirement

Cassendra Williams retired from the Business Management Directorate.

Resignations

Susan Taylor resigned from Engineering.

Reassignments

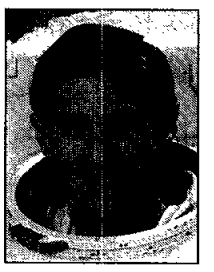
Deborah Neubek moves from the International Space Station Program to Engineering.

Apt retires from astronaut corps

Astronaut Jay Apt will leave NASA this month, and Steve Hawley will resume his position as Flight Crew Operations deputy director.

Four-time shuttle veteran Apt will leave NASA in late May to become director of the Carnegie Museum of Natural History in Pittsburgh.

"The astronaut office will miss Jay's dedication and spirit," said Dave Leestma, director of Flight Crew Operations. "I am sure he will use this new position to continue his efforts to educate and inspire young people to excel."



Apt

Apt first flew on STS-37 aboard *Atlantis* in 1991, conducting two space walks, including one unscheduled extravehicular activity to manually deploy the antenna on the Gamma Ray Observatory spacecraft.

He flew twice on *Endeavour*, during STS-47 in 1992 for the Spacelab-J mission, and again for STS-59, the first flight of the Space Radar Laboratory in 1994. Most recently, Apt flew aboard *Atlantis* on STS-79, the fourth shuttle-Mir docking mission, in 1996.

"Every minute that I've been a part of the space exploration program has been fascinating," Apt said. "I am thrilled by the chance to return to Pittsburgh and lead one of the best museums in America into the next century."

Steve Hawley has resumed his position as deputy director of Flight Crew Operations after he and his STS-82 crew mates successfully serviced the Hubble Space Telescope earlier this year.

Linda Godwin, who has been acting deputy director in Hawley's absence, will return to her previous position as deputy chief of the Astronaut Office.

Dates & Data

May 9

Space society meets: The Clear Lake Chapter of the National Space Society will meet at 6:30 p.m. May 9 at the Holiday Inn at Hobby Airport. Virgil Sharpton will discuss "The Chicxulub Crater: Site of the Cosmic Collision that Ended the Dinosaurs' Reign." For information call Murray Clark at 367-2227.

Astronomers meet: The JSC Astronomical Society will meet at 7:30 p.m. May 9 at the Lunar and Planetary Institute, 3600 Bay Area Blvd. For more information call Chuck Shaw at x35416.

Web training: The Safety Reliability and Quality Assurance Directorate will provide hands-on demonstrations of its Internet-distributed training and on-the-job information resource from 9 a.m.-2 p.m. May 9 in Bldg. 12 Rm. 276. For details call Jeff Evans at x39295.

May 10

Sailboat rides: The Clear lake Sailing Club will offer free sailboat rides May 10 at Clear Lake Park. For reservations call Richard Hoover at 996-7716.

May 13

NPMA meets: The National Property Management Association will meet at 5 p.m. May 13 at Robinette and Doyle Caterers, 216 Kirby in Seabrook. Social and dinner cost $14. For more information call Sina Hawsey at x36582.

Aero club meets: The Bay Area Aero Club will meet at 7 p.m. May 13 at the Houston Gulf Airport clubhouse at 2750 FM 1266 in League City. For more information call Larry Hendrickson at x32050.

May 14

Spaceland Toastmasters meet: The Spaceland Toastmasters will meet at 7 a.m. May 14 at the House of Prayer Lutheran Church. For details call Jeannette Kirinich at x45752.

Spaceteam Toastmasters meet: The Spaceteam Toastmasters will meet at 11:30 a.m. May 14 at United Space Alliance, 600 Gemini. For details call Pat Blackwell at 282-4302 or Ben Black at 282-4166.

MAES meets: The Society of Mexican American Engineers and Scientists will meet at 11:30 a.m. May 14 in the Bldg. 3 cafeteria. For additional information call G.D. Valle at x38835.

Astronomy seminar: The JSC Astronomy Seminar will be held at noon May 14 in Bldg. 31 Rm. 129. Mark Matney will discuss "Weathering Meteor Storms—Predicting the Leonids." For more information call Al Jackson at x35037.

PSI meets: The Clear Lake/NASA Chapter of Professional Secretaries International will meet at 5:30 p.m. May 14 at the Holiday Inn, NASA Road 1. Dinner costs $15. For more information call Elaine Kemp at x30556.

May 19

NBL dedication: The dedication of the Sonny Carter Training Facility Neutral Boyancy Lab will be held from 10-11 a.m. May 19. For more information call Pam Adams at x35599.

May 17

NTA meets: The National Technical Association will meet at 10 a.m. May 17 at Texas Southern University School of Technology, Rm. 316. For more information call Pam Denkins at x35272.

May 21

Spaceland Toastmasters meet: The Spaceland Toastmasters will meet at 7 a.m. May 21 at the House of Prayer Lutheran Church. For more information call Jeannette Kirinich at x45752.

Spaceteam Toastmasters meet: The Spaceteam Toastmasters will meet at 11:30 a.m. May 21 at United Space Alliance, 600 Gemini. For more information call Pat Blackwell at 282-4302 or Ben Black at 282-4166.

Astronomy seminar: The JSC Astronomy Seminar will be held at noon May 21 in Bldg. 31 Rm. 129. An open discussion meeting is planned. For more information call Al Jackson at x35037.

Scuba club meets: The Lunarfins will meet at 7:30 p.m. May 21 at the Redfish Restaurant under the Kemah/Seabrook bridge, Seabrook side. For more information call Fred Toole at x33201.

May 22

Directors meet: The Space Family Education board of directors will meet at 11:30 a.m. May 22 in Bldg. 45 Rm. 712D. For more information on this open meeting call Gretchen Thomas at x37664.

May 23

Electrical fair: JSC will host an electrical safety fair from 10a.m.-2 p.m. May 23 at Bldg. 30. For more information call Rindy Carmichael at x45078.

May 24

Exhibit opens: Space Center Houston will premiere "Robot Zoo" May 24. For more information call SCH at 244-2105.

May 29

Radio club meets: The JSC Amateur Radio Club will meet at 7 p.m. May 29 at Piccadilly Cafeteria, 2465 Bay Area Blvd. For details call Larry Dietrich at 39198.

June 5

Warning system test: The sitewide Employee Warning System will undergo its monthly audio test at noon June 5. For more information call Bob Gaffney at x34249.

June 8

Space symposium: NASA and the International Academy of Astronautics will host the 12th Man in Space Symposium June 8-13 in Washington D.C. Topics include countermeasures, biology, environmental and human factors, life support and space walking and physiology. For details, check out the symposium's web site at: http://cass.jsc.nasa.gov/12misf.html

June 10

Aero club meets: The Bay Area Areo Club will meet at 7 p.m. June 10 at the Houston Gulf Airport clubhouse at 2750 FM 1266 in League City. For more information call Larry Hendrickson at x32050.

June 11

MAES meets: The Society of Mexican American Engineers and Scientists will meet at 11:30 a.m. June 11 in the Bldg. 3 cafeteria. For details call G.D. Valle at x38835.

News Briefs

Electrical Safety Fair

"Watt is Electrical Safety?" is the theme of this year's annual Electrical Safety Fair. The fair will be held from 10 a.m.-2 p.m. Friday, May 23 in the Bldg. 30 lobby, auditorium and north overhang. Plenty of handouts will be given, and there will be challenging ways of winning a 'special' prize. The grand prize is a framed shuttle photograph signed by astronauts. Free popcorn, free drawings, free advice and free literature—all of which is designed to reinforce what people already know and help them learn what they do not know about the safe handling of electricity will be available. For more information call Rindy Carmichael at x45078.

Student winners to be honored

Twenty-seven students from public and private schools across the U.S. have won national recognition in NASA's 17th annual Space Science Student Involvement Program competition and one winner will spend this summer at JSC. Students in grades 9-12 competed for a one-week internship with their teacher/advisor at a NASA facility. Maureen Morgan, of Parma, Ohio, will intern at JSC with scientists and engineers working on the International Space Station.

Antimatter clouds, fountains discovered in Milky Way galaxy

Scientists using data from an instrument on NASA's Compton Gamma Ray Observatory have discovered two unexpected clouds of antimatter in the Milky Way galaxy which scientists call "antimatter annihilation radiation." Instruments point to the existence of a hot fountain of gas filled with antimatter electrons rising from a region that surrounds the center of the Milky Way galaxy. The nature of the furious activity producing the hot antimatter-filled fountain is unclear, but could be related to massive star formation taking place near the large black hole at the center of the galaxy. Other possibilities include winds from giant stars or black hole antimatter factories.

Discovery missions earn more study

In the first step of a two-step process, NASA has selected five proposals for detailed study as candidates for the next missions in the agency's Discovery Program of lower-cost, highly focused scientific spacecraft. The proposed flights would send spacecraft to study Mercury, the atmosphere of Venus, the moons of Mars, comets and the solar wind.

Space News ROUNDUP

The Roundup is an official publication of the National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Texas, and is published every other Friday by the Public Affairs Office for all space center employees. Deadline for the submission of articles is Friday, three weeks before the desired date of publication.

The Roundup office is in Bldg. 2, Rm. 181. The mail code is AP2. The main Roundup telephone number is x38648, and the fax number is x45165. Electronic mail messages may be directed to khumphri@gp301.jsc.nasa.gov or kschmidt@gp301.jsc.nasa.gov.

Editor .....Kelly Humphries
Managing Editor . . .Karen Schmidt

New store opening in Bldg 3; updates under way in Bldg 11

The Employee Activities Association is building a new employee store in Bldg. 3 and making improvements to the current store in Bldg. 11.

The new store opened its doors Monday with a grand opening planned in late May once all the store's elements are in place.

"We've had to make a lot of changes over the last year to operate in the black," said Harvey Hartman, chairman of the JSC Exchange Council. "The new employee store is a part of the Exchange's effort to improve services in this cost-cutting time."

The design strategy for Bldg. 3 was to create an employee store with an emphasis on services. For example, the retail team is in the process of negotiating a UPS package counter, a floral agreement and a magazine and newspaper deal. Also, they expect to sign a contract with a national photo processing lab. The overall price structure for processing should easily beat most pharmacies, grocery and some discount stores. JSC's photo lab reports that the retail team has negotiated a very good deal in terms of quality and price.

Besides new services, employees will find apparel, children's items, books, CD ROMs, special occasion gifts for retirements and holidays like Mother's and Father's Day plus a lot of other surprises. In addition, the retail team is making progress in negotiations with Hallmark and other greeting card vendors.

The Bldg. 11 store will expand to provide magazines, photo processing, greeting cards and some of the new merchandise popular in Bldg. 3. Lighting enhancements and other facelifts also are in work.

"The Exchange is excited about the new store opening and the updates to Bldg. 11," said Teresa Sullivan, the Exchange Operations manager. "We think we've picked a winning mix that will offer popular services and products. We're always open to merchandise suggestions and adjustments from our customers. We want our stores to be a big success."

Grand opening of the Bldg. 11 store will be announced later in May. In the meantime, new items will be coming in every day. Currently, the retail team is working on it's grand opening campaign that will include a computer "silent" auction, discounts on photo processing, and other special offerings.

JSC creativity, expertise play role in new pyramid

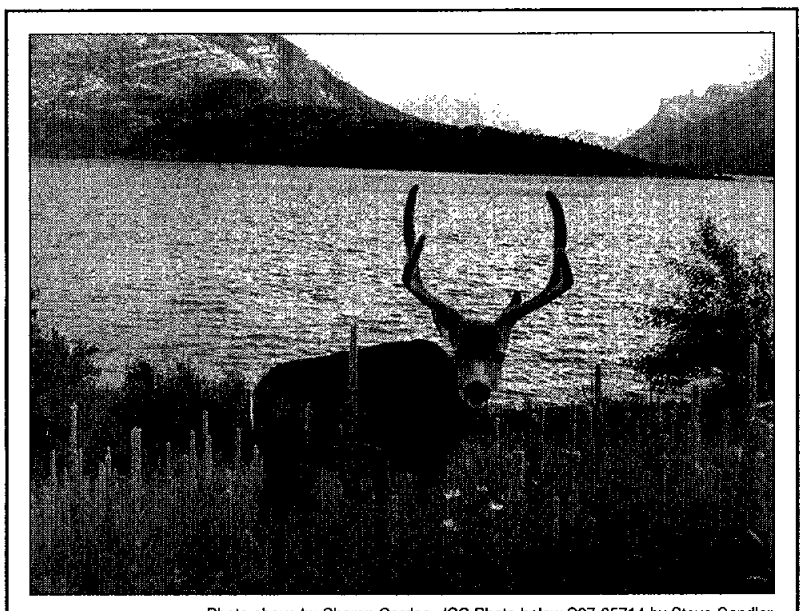
Moody Gardens' new Discovery Pyramid—which will showcase the ideas and efforts of many JSC employees who banded together to assist with the Galveston outreach project—will open to the public June 7.

The new edifice is the result of consultations between the museum and JSC volunteers who lent their creativity and space expertise to the project, which began just one year ago.

Civil service and contractor workers will receive a "sneak preview" opportunity to view the results of the collaborative educational outreach effort May 29-31 when they can take advantage of a 2-for-1 ticket offer. Coupons, redeemable at Moody ticket outlets, will be made available at JSC in the coming weeks.

Construction of the new pyramid, which is in the shadow of the larger Rainforest pyramid, is nearly complete. The exhibit contractor, Southwest Museum Services of Houston, was expected to begin installing exhibits this week.

The first-floor attraction of the new pyramid will be an IMAX Ridefilm Theatre, which will be premiering the "Asteroid Adventure" film. The second floor will house the human space flight exhibits developed in consultation with the JSC team, which have been built around the futuristic theme of "Living in the Stars." The exhibits will include a full-motion simulated hologram of historical figures such as Leonardo Da Vinci and Albert Einstein explaining the discoveries that have made human space exploration possible. Other exhibits will focus on the future of human space flight, with sections on living in space, space travel, destinations and NASA's future.



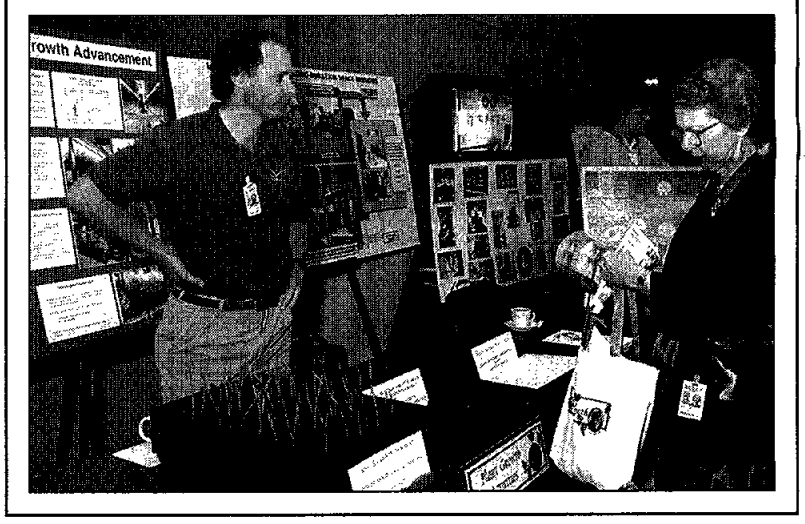


Photo above by Sharon Cordes, JSC Photo below S97-05714 by Steve Candler

PHOTO WINNER—Above: Sharon Cordes of Center Operations won the JSC Earth Day overall photo contest with her photo of a mule deer at the Waterton Lakes National Park in Alberta, Canada. Other winners included second place overall, Bill Dwyer of Engineering; third place overall, Dwyer and Melissa McKinley of Center Operations; best local photo, Ginger Gibson of Center Operations; and best Earth Day theme photo, Scott Lazaroff of Engineering. Below: Engineering's Doug Ming shows JSC's effort in advanced Life Support and recycling in space.

Cosmonaut praises new Russian suit's flexibility

(Continued from Page 1)

around the Mir, was installed near a pair of similar experiments attached to the Docking Module by STS-76 space walkers Linda Godwin and Rich Clifford 13 months ago. A short time after its installation, the OPM was activated and was reported to be in good working order.

The Mir Environmental Experiment Packages will be retrieved by veteran cosmonaut Vladimir Titov and astronaut Scott Parazynski during a space walk outside of *Atlantis* during the STS-86 mission to the Mir in September. Titov will become the first Russian to conduct a space walk wearing a U.S. suit during that excursion.

With their first task completed, Linenger and Tsibliev returned to the cargo crane and slowly swung back to the Kvant-2 module, where they installed a meter to monitor radiation levels around the Mir. Video of the space walk, downlinked to the Russian Mission Control Center by Flight Engineer Alexander Lazutkin inside Mir, showed the two space walkers operating with care near the Mir's delicate solar arrays as they worked to the timeline crafted over the past year.

Linenger and Tsibliev then retrieved a pair of micrometeorite and debris particle collection experiments from the exterior of Kvant-2 which had been left outside last year by Mir 21 cosmonauts Yuri Onufrienko and Yuri Usachev. The experiments were returned to the Kvant-2 airlock where they will be stowed before being brought back to Earth.

Finally, at 5:08 a.m. CDT, after five hours outside Mir, Linenger and Tsibliev returned to Kvant-2 and repressurized the airlock to complete the space walk. It was Tsibliev's sixth excursion outside Mir in his two flights dating back to 1993.

Gen. Yuri Glazkov, deputy director of the Gagarin Cosmonaut Training Center in Star City, outside Moscow, congratulated Linenger and Tsibliev for their performance following the completion of the space walk for which they had trained for more than a year. In a post-space walk debriefing with flight controllers, Tsibliev again praised the new spacesuits, particularly the helmet visors and the flexibility of the shoulders, arms and knees, which enabled him and Linenger to move with relative ease outside the station.

Tsibliev plans two more space walks outside Mir with Lazutkin in late June and early July to erect an experiment platform on the Spektr module and to prepare valves on the outside of the Core Module for later work designed to add a second carbon dioxide removal system to the outpost.

The crew members relaxed on Wednesday after the space walk before resuming their scientific agenda and their search and repair of a small cooling loop leak in the Kvant-1 module. Otherwise, the Mir's systems continue to operate normally as plans proceed for the launch of *Atlantis* in mid-May to deliver U.S. astronaut Mike Foale to the complex to replace Linenger.

MCC open for STS-84

The Mission Control viewing room will be open for JSC and contractor employees and their families during portions of the STS-84 mission.

Employees must wear their badges and escort family members through the lobby of Bldg. 30 South. Children under five will not be permitted. No flash photography or loud talking will be permitted. Because of the dynamic nature of shuttle missions, viewing hours may be changed or canceled without notice.

Viewing rooms hours will be posted in the Daily Cyber Space Roundup and recorded on the Employee Information Service as soon as they become available. The Employee Information Service number is x36765.

NBL facility dedication set

All JSC civil service and contractor employees are invited to attend the official opening and dedication of the Sonny Carter Training Facility Neutral Buoyancy Lab from 10 - 11 a.m. Monday, May 19, at the NBL.

The program will include remarks by U.S. Rep. Tom DeLay, R-Texas, NASA Associate Administrator Mike Mott, JSC Director George Abbey and Space and Life Sciences Director David Short. A tour of the state-of-the-art NBL will be offered following the ceremony.

Attendees are encouraged to ride the JSC Shuttle bus—Route B. An additional bus will be added to the schedule so that buses will run every 20 minutes beginning at 8:05 a.m. at Bldg. 1. There will be no parking available at the SCTF.

For more information call Pam Adams at x35599.

'Take time to be a leader,' Stonecipher urges

(Continued from Page 1)

National Advisory Committee for Aeronautics in 1950 at Lewis Flight Propulsion Laboratory (now Research Center) and in 1958 worked on the planning team to organize the National Aeronautics and Space Administration. He moved to Houston and the new Manned Spacecraft Center in 1964 and served here as deputy director.

Following the fatal Apollo 204 fire, Low became manager of the Apollo Spacecraft Program Office, overseeing preparations for the successful lunar landing program. He later became NASA deputy administrator and retired in 1976 to become president of Rensselaer Polytechnic Institute.

Stonecipher urged those in the audience to follow Low's example and pay careful attention to the leadership aspects of their jobs.

"All of you in this room are really involved in making history. You're making history and moving frontiers that are truly difficult to move," he said. "Please take time to be a leader. It will be a heck of a lot more fun and it will be a heck of a lot more effective in the end."

NASA-JSC