

Space News ROUNDUP!

In this issue



Neurolab research activities continue on *Columbia* **Page 2**



Middle school students get hands-on learning experience underwater **Page 3**



Good weather and good barbecue highlight JSC Family Picnic **Pages 4-5**



In 1985, two astronauts conduct the first contingency EVA in shuttle history **Page 6**



Annual Easter egg hunt brings smiles to children's faces. **Page 7**



JSC employees volunteer to clean up for the Earth Day Trash Bash. **Page 8**

Neurolab research hits stride

Two-week flight lifts off one day late, but research proceeds apace

Research into the intricacies of the human nervous system will continue next week as the two-week-long Neurolab mission employs a combination of human and animal subjects to study questions of interest in space and on Earth.

Shuttle managers are expected to decide this week whether there are enough consumables on board the Space Shuttle *Columbia* to support a one-day extension of the mission. Pre-launch plans called for a landing at 11:09 a.m. CDT May 3 at Kennedy Space Center, but the landing could be pushed back a day, to May 4, to accommodate an

extra day of science investigations.

The launch of *Columbia* and its seven-member crew was delayed one day when pre-launch checks of communications equipment turned up a failed network signal processor. The need for two functional systems to send commands from the ground to the shuttle and back forced the launch team to enter the vehicle and change out the signal processor.

Launch occurred the next day, April 17, on time at 1:19 p.m., and featured the first use of the orbital maneuvering system engines in a test to see how well they could work in tandem with the shuttle's three

main engines to boost additional cargo into orbit for assembly flights to the International Space Station. Crew members reported the test went smoothly.

Once on orbit, Commander Rick Searfoss along with Pilot Scott Altman, Mission Specialists Rick Linnehan, Kay Hire and Dave Williams, and Payload Specialists Jay Buckley and Jim Pawelczyk immediately began activating the Spacelab module and moving ahead with their research, supported on the ground by an international team of researchers.

Please see **NEUROLAB**, Page 8



KSC-98EC-0506
Columbia lifts off from Launch Pad 39B at Kennedy Space Center to begin the STS-90 Neurolab mission.



JSC Photo S98-05024 by Joe McNally, National Geographic, for NASA

A large crowd of JSC employees listen to President Bill Clinton during an April 14 visit to the center. On the dais with the President (seated, from the left) are JSC Director George Abbey, U.S. Sen. Nick Lampson (D-TX), and Houston Mayor Lee Brown. Standing behind them are members of the STS-95 crew: (from the left) Pedro Duque of ESA, Chiaki Mukai of NASDA, U.S. Sen. John Glenn Jr. (D-Ohio), Stephen Robinson, Scott Parazynski, Steven Lindsey (behind Clinton) and Curtis Brown Jr. Out of the frame is NASA Administrator Daniel S. Goldin who also addressed the crowd. The Chief Executive earlier had gone inside several of the shuttle and ISS crew training facilities and mockups.

Clinton affirms his support for space program

By Kelly Humphries

President Bill Clinton voiced strong support for NASA during a visit here April 14, saying he is "committed to maintaining a strong, stable, balanced space program" and expressing admiration for the work of JSC's scientists, engineers, astronauts and other workers.

Clinton also gave a pre-flight pep talk to the STS-90 crew in Florida via a two-way audio-video hookup with Kennedy Space Center's crew quarters during a visit to Houston that also involved participation in a televised roundtable on discrimination and sports.

"On behalf of all our fellow Americans, I want to thank you, those of you who work here, for expanding the frontiers of our knowledge, launching our imaginations, helping our spirits to soar," Clinton told about 300 JSC employees who gathered in Bldg. 9. "Each of you, our scientists, our engineers, our astronauts, those of you who work in other capacities, embody the bold, restless pioneering spirit of America."

"Thanks to NASA, America has met President Kennedy's challenge of becoming the world's leading space-faring nation," the President continued. "We've

Please see **CLINTON**, Page 8

Steering council tightens computer password security

Changing computer passwords is a routine part of daily life at JSC, and starting May 5 there will be one more for some users to change. But this one will put the center on a path that could eventually lead to the elusive "single log-on" that will allow users access to all the systems they need with a single ID.

JSC's Information Resource Management Steering Council has decided that it's time to begin taking steps to improve computer security and authentication processes. One

way to do that is by changing passwords on a regular basis. The JSC Automated Information Systems Security Manual requires that passwords be changed at least every 90 days for general purpose workstations and networks.

While some users already voluntarily change their passwords regularly, one of the most widely used systems, the JSC NT Domain, has not forced users of institutional computer services such as Microsoft Exchange e-mail, Schedule+ or any

of the institutional file servers to change their passwords. That's pretty much everybody who uses a computer at JSC.

"The agency and center are placing continually increasing emphasis on substantially improving the protection of our information resources," said Carroll Dawson, deputy Chief Information Officer. "JSC is aggressively pursuing implementation of a wide range of technologies from sophisticated "firewalls" around our networks to "single

log-on" authentication processes which enable access to all resources available to a user. A key element of this comprehensive security initiative is an effective process for individual password protection."

As of May 5, the IRMISC has decided, users of the JSC NT Domain will be required to change their password at least every 90 days.

JSC Domain passwords will begin to expire on May 5. "Expire" means Please see **DOMAIN**, Page 8

Space station long spacer element arrives at KSC

By James Hartsfield

The long spacer, one of two structures that will make up a truss to support the first solar arrays for the International Space Station, arrived at the Kennedy Space Center's Space Station Processing Facility earlier this month.

Built in Tulsa, Okla., by Boeing-Canoga Park, construction of the flight article began in the fall of 1996. Along with the integrated electronics assembly which arrived at KSC in January,

the long spacer completes the trusses that will support the first solar arrays for the station.

Within the next two months, radiators, pump-control systems, batteries and related electronics will arrive at Kennedy. In the fall, the first set of International Space Station solar arrays will arrive at KSC, completing the set of equipment and trusses that comprise the first station Photovoltaic Module.

"The Element Integration Office here at JSC, especially Steve Porter Please see **LONG**, Page 2



The Long Spacer, a component of the International Space Station, arrives and is moved to its test stand in Kennedy Space Center's Space Station Processing Facility. It is being processed in preparation for launch aboard *Discovery* in April 1999.

Thomas adapting to work in microgravity environment

U.S. Astronaut Andy Thomas is continuing his work on the Mir Space Station with the Biotechnology System Co-Culture experiment as it attempts to grow two different cell types and form three-dimensional tissue samples.

Thomas has been performing visual inspections, photographing the cultures, sampling the cells and replenishing nutrients and ensuring the chamber is rotating as it should.

In a televised interview, Thomas talked about the difficulty of performing the work in microgravity.

"When you're doing work with tools and instruments it can be very difficult because everything floats away," he said. "So the simple act, for example, of undoing a screw, can be quite complicated, because as soon as the screw comes free it will float away, the screwdriver in your hand will float away. So everything has to be tethered down, and it can be difficult to work under those circumstances. You need extra pairs of hands always to grab these things that are floating around."

After nearly 100 days in space, Thomas

said he is getting better at working in the space environment.

"You get accustomed to it after a while, though," he said. "There's a learning curve you go through and then you become quite adept at it."

The science investigations are part of 27 studies in the areas of Advanced Technology, Earth Sciences, Human Life Sciences, Microgravity Research, and International Space Station Risk Mitigation.

Commander Talgat Musabayev and Flight Engineer Nikolai Budarin completed their fourth space walk April 17, preparing a new thruster jet assembly for last week's installation atop the Sofora truss.

The first task was to dismantle and stow the 'Rapana' truss segment once used as a support fixture for external scientific experiments. Though the flight control team originally had planned for the truss to be jettisoned during

the space walk, it was decided instead to stow it for possible future use.

Next, the new boom jet assembly was raised by ground command from the side of the specially modified Progress resupply ship.

The crew set the boom jet to the proper angle, and locked it in place where it will remain until the next space walk Wednesday. The angle provides for easier transfer to the Sofora truss.

This was the fourth space walk scheduled during the Mir 25 crew's six-month tour on the station that began in late January. Thus far, Musabayev and Budarin have spent 23 hours, 47 minutes outside the station. The fifth and final space walk was targeted for Wednesday.

Previous space walks saw the two cosmonauts remove and jettison the nearly spent boom jet used for roll control of the station in pointing Mir's solar arrays at the Sun. The 14-meter-long Sofora truss is projected to re-enter

the Earth's atmosphere and burn up within a year. Next the crew removed the old boom jet adapter plate and installed a new one.

Throughout all of the space walks, Thomas documented his colleagues movements with video and still photography and provided the flight control team with routine systems data.

Thomas said he isn't scheduled to make a space walk with his Mir crew mates, but that he'd be ready if called upon.

"There's not a piece of U.S. equipment that really requires a U.S. crew person's presence. The space walks all require the cosmonauts because they're very labor intensive on the apparatus of the station and they've been trained for many hours in those activities. Should one ever present itself as, perhaps, one day it might, though I don't think during this flight, I'd like to step up to it," he said.

Today marks Thomas' 92nd day in space. He will return to Earth in early June following the STS-91 mission. Thomas is the seventh and final NASA astronaut scheduled to live and work aboard Mir.



Station node receives new name, 'Unity'

The first International Space Station node, a connecting module that will be the first United States-built component to reach orbit, has been named "Unity."

The name honors the spirit of international cooperation reflected worldwide in the work of those building the station. As a building block, the node will unite station modules from Russia and the U.S. The Unity node lays a foundation for the station that will combine contributions from 16 nations in a scientific effort unparalleled in history. The spirit of the International Space Station has crossed barriers of language, culture and distance and brought together the world's best and brightest to join hands in the exploration of space.

Unity will be a passageway for station crews as they move through modules built at locations across the globe. It also may serve as a future passageway to even grander peaceful alliances both on Earth and in space.



JSC Photo 98-03937 by Steve Candler

Payload Specialist Jay Buckley (right) applies a pressure cuff to the arm of Commander Rick Searfoss. The photo, one of the first documenting Neurolab activity on the scheduled 16-day mission, was taken with an electronic still camera. Investigations during the Neurolab mission will focus on the effects of microgravity on the nervous system through studies of blood pressure, balance, coordination and sleep patterns, and all have potential benefit to researchers on Earth studying a variety of illnesses.

Air turbulence sensor may make air travel safer for commercial flights

NASA is testing a new sensor that may make air travel safer by detecting previously invisible forms of clear air turbulence and giving pilots time to take safety precautions. Early tests of the new clear air turbulence sensor are promising, officials say.

Clear air turbulence is an invisible safety hazard for aircraft. Though seldom damaging to modern aircraft, which are designed to withstand its stresses, it is the leading cause of in-flight injuries among the flying public.

Currently there are no effective warning systems for clear air turbulence. It's been referred to as "rough air" or "air pockets," that can be felt, but not seen.

"During the tests, the system observed turbulent regions of air ahead of the aircraft as it moved forward. The aircraft experienced disturbances as it penetrated the turbulence. In that scenario, if an alarm were sounded when turbulence was first detected, passengers could have quickly returned to their seats and fas-

tened their seat belts before the encounter," said project manager Rod Bogue of Dryden Flight Research Center.

Flights of the detector originated from Jefferson County Airport, near Broomfield, Colo. The experiment was flown on three separate flights for a total of more than seven hours at altitudes as high as 25,000 feet. Additional flights are slated to add to the turbulence database and to fine-tune the sensor for better measurements.

The sensor device, called Airborne Coherent LIDAR for Advanced In-flight Measurement, relies on a form of laser technology called Light Detection and Ranging, to detect changing velocities of tiny particles in turbulent air. As long as the wind velocity remains uniform, no turbulence exists. But if the laser beam detects changes in the wind speed, it's a clear indication of turbulence ahead.

During its first flight, the flight crew located turbulent conditions and used the infrared radar to measure the changes in wind speed, before flying through the dis-

turbed air. Once the aircraft reached the turbulence, the crew compared the pre-encounter measurements with the effects of the turbulence they experienced. In this way, the team is exploring the relationship between the laser radar-measured turbulence characteristics and the actual turbulence experienced by the aircraft. These tests are designed to provide an efficient checkout of the flight hardware and to help characterize turbulence measurements.

"Not much is known about accurately detecting and forecasting turbulence," said Larry Cornman, scientist for the National Center for Atmospheric Research, Boulder, Colo. "Through this new device and turbulence research conducted at NCAR, we expect a clearer picture to emerge to make flying safer."

Langley is the Agency's lead center for the NASA Aviation Safety program. Other participating NASA centers include Dryden, Ames Research Center and Lewis Research Center.

Long Spacer arrives at KSC

(Continued from Page 1)

and Brent Adams, have been instrumental in overseeing the fabrication and delivery of the long spacer," said Ron Torcivia, launch package manager for station assembly flight 4A, which has the first photovoltaic module as the primary cargo for STS-97 next year.

"Steve and Brent, working closely with Nanette Brouhard and Kevin O'Hara of Boeing-Canoga Park, should be congratulated for their efforts in securing a timely delivery to KSC," Torcivia added.

The long spacer immediately began processing after its arrival at KSC as it was removed from the shipping container and installed into a test stand located in the northeast corner of the Space Station Processing Facility high bay.

The long spacer will be equipped with radiators and the two Pump and Flow Control subassemblies that will circulate ammonia to cool the solar array electronics. Also to be mounted to the long spacer are ammonia fluid lines as part of the cooling system, and the cabling necessary for power and control of the station. When it is mated to the integrated electronics assembly, the long spacer will become an integral part of a station truss segment. The IEA will include the batteries and associated electronics to store the electrical power generated by the solar arrays for use by the station modules. The IEA and long spacer are scheduled to be fully outfitted and begin integrated testing later this spring.

When the solar arrays arrive this fall, all major equipment for launch on assembly flight 4A, aboard *Discovery* on STS-97, will be at KSC. The entire photovoltaic module package will be assembled by this winter for the start of launch preparation.

Elsewhere in the Space Station Processing Facility, work is progressing on the Unity node, or Node 1. The first connecting module for the station and the first U.S.-built station element, Node 1 has been named Unity in honor of the spirit of international cooperation that has made the International Space Station possible. In function, the first node will unify modules built by the U.S. and Russia while it also unites former Cold War adversaries as allies working together to explore space.

A four-day leak-check test of the Unity node concluded early this month with the flight hardware displaying virtually no signs of leakage.

For the test, Unity and the attached docking adapter, technically known as Pressurized Mating Adapter-1, were installed in the payload canister. The canister was then pressurized with a partial mixture of helium and air. Helium sensors installed in the canister monitored the hardware for signs of helium leakage.

Ensuring that the hardware is sealed against exposure to the vacuum of space is a key aspect of preparing the International Space Station hardware for flight. Payload engineers were delighted with the results, which confirmed the integrity of the U.S.-built hardware.

"The leak test was very successful," said STS-88 KSC Payload Manager Steve Ernest, adding that one more pressurization test will be conducted prior to being transported to the launch pad.

Students observe effects of gravity on nervous system

Students from around the world are learning about the upcoming Neurolab mission by logging onto the Internet.

They are learning how scientists, technicians and astronauts are preparing for the STS-90 mission, which lifted off Friday. Neurolab is studying the effects of weightlessness on the nervous system.

"NASA is breaking a time barrier by enabling students to interact with Neurolab researchers via the Internet long before any new information is printed in textbooks," said

Linda Conrad, NeurOn (Neurolab Online) Project Manager at Ames Research Center. "About 50 scientists, engineers and the shuttle and ground crews are working with students and educators through the Internet project."

The NASA on-line mentors upload biographies and field journals to the NeurOn Internet pages. NASA employees from Ames, Johnson Space Center and Kennedy Space Center will answer students' e-mail questions and will participate in "Web chats" with

youngsters and teachers. During Internet chats, students use computers to converse with mentors by typing questions and reading responses and dialogue via the World Wide Web.

NASA scientists note that, even after 50 years, they know very little about the way the brain and nervous system are affected by space flight. The STS-90 Neurolab mission is expected to answer many questions about the way the nervous system reacts to microgravity.

There are 26 experiments sched-

uled for Neurolab. "Lesson plans for teachers are available on the website so they can more easily integrate NeurOn activities related to the experiments into the classroom," Conrad said.

The young students may monitor activities of ground crew members as they assemble hardware and prepare provisions such as food and water, for the 16-day mission aboard the Space Shuttle *Columbia*. The seven-member crew will conduct the experiments.

In their classrooms, students

simulate mission activities to better understand the Neurolab mission. The NeurOn website includes a section that displays projects for youngsters and galleries of student work.

These interactive projects connect students with NASA employees and are designed to inspire young people to pursue careers in high technology.

The NeurOn website may be found on the Internet at:

<http://quest.arc.nasa.gov/neuron>

Community News

Students get hands-on experience

Deer Park class designs, builds own space station

Taking inspiration from the International Space Station project, a group of Fairmont Junior High eighth-grade students just completed a six-week project that sent their collective imagination shooting into orbit.

The idea seemed simple enough. Students would design and build their own mock space station. The students would be involved in areas ranging from public relations to scientific experiments, all relating to the space station project. This would be no simple task for the class or its teacher.

After attending a Friends and Family Workshop for Educators at JSC last year, teacher Jim Glock contacted NASA employees, with whom he discussed his plans for the activity. Glock said he wanted to show students how important the space program is to the country and how space history affects their daily lives in many ways.

"I also wanted them to see how real the space station is, how it is an international venture and how soon it will begin," he said. "It will be at least a seven-year overall construction project that these students can relate to during their high school years."

The students, while following the construction of the International Space Station, likely will remember their own space station project as well. Students in Glock's class were divided into teams, each responsible for a different area of the project. They included a public relations team, a scientific team, an astronaut team and a manufacturing-safety team.

Glock said involving students in the various aspects of a large-scale project meant that students had to use many skills they had learned in other classes. All the teams used their scientific knowledge for the experiments the scientific team planned, and mathematics was relied upon heavily by the manufacturing-safety team and astronaut team. The public relations team, with the assistance of Steve Nesbitt, from JSC's Public Affairs Office, honed its writing skills to

compose press releases. Astronaut team members also trained with physical education teacher Tommy Graham and were given a simple physical by nurse Shirley Nash.

Students also had a chance to do some hands-on testing of several science concepts. During the extravehicular activity, Glock's students performed several experiments. Students performed a heart-rate experiment, demonstrated the El Niño effect with hot- and cold-water-filled balloons and determined how to make an object neutrally buoyant. All of the experiments were intended to build upon the information the students were learning in their regular classes and bring the space program closer.

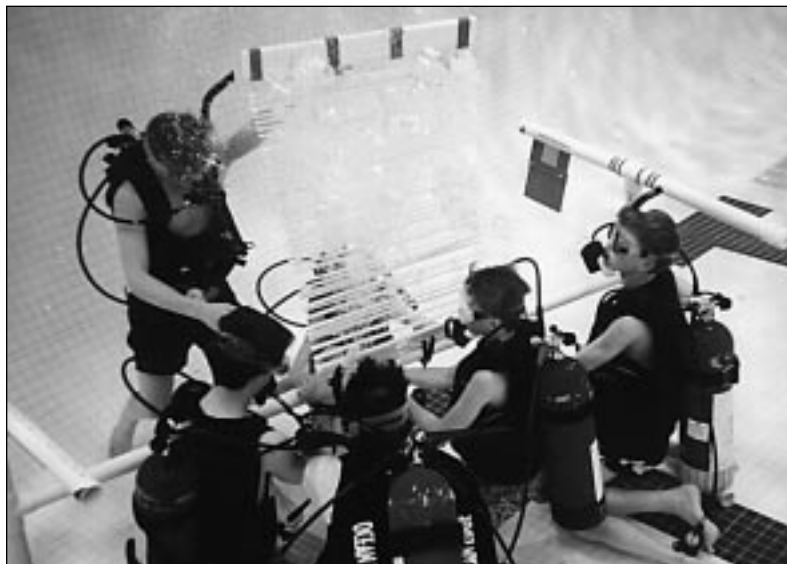
Several NASA employees appeared as guest speakers and hosted field trips during which the students viewed the Super Guppy and other NASA aircraft. Nigel Packham, crew commander for the fourth phase of the Advanced Life Support Program Lunar-Mars Life Support Test Project, spoke to students about his experiences during a 90-day chamber test.

John Louis and his staff toured students through the Sonny Carter Training Facility's Neutral Buoyancy Laboratory. Norm Chaffee, from JSC's Education and Information Services Branch, arranged tours of the NBL, the Super Guppy and other NASA aircraft.

At the project's end, the student astronaut team assembled its mock space station in its own weightless environment training facility—the school's swimming pool. Astronaut team members had completed scuba instruction, thanks to the help of Dolphin Divers of Texas. As classmates and others watched, the team pieced together the space station.

Glock said the response from students was tremendous.

"I really think that the entire class will remember this project for a long time," Glock said. "I know that the students have a better understanding of what it takes to live and work in space."



Above: Astronaut team members deploy a solar panel during their project to design and build a model space station in their own weightless environment training facility—the school's swimming pool. **Left:** A white board shows the students' flight plan for the assembly of Space Station Viking, deployment of the "solar panels" and various experiments they conducted during the extravehicular activity. **Below:** NASA's Carl Koontz explains the flight profile of the KC-135 zero-gravity simulation aircraft to students from Jim Glock's class during their tour of Ellington Field.

Photos courtesy Jim Glock



Long-lived JSC carpool saves cash, resources

Can you believe? A carpool from the Meyerland area in west Houston to JSC has been going strong since 1969. That's 28 years of continuous operation.

The original five JSC employees who started the carpool; Mel Kapell, Bob Patterson, Al Feiveson, Bob Cohen and Steve Jacobs primarily were interested in saving money. They also hoped to reduce the monotony and stress of the daily 65-mile round trip. A third objective was environmental.

The group reaped the benefits of carpooling during the Arab oil embargo of the mid 1970s. Rising gas prices, long lines at the gas pumps and reserved parking spaces at JSC for carpools fortified their determination to keep the carpool going. Although two members have retired, the rest are steadfast in their goal to save the environment, their nerves and, most of all, their money.

The bottom line is 1.4 million driving miles saved. Assuming \$1 and 15 miles for a gallon of gas, \$1 per quart of oil and 5 quarts of oil per 5,000 miles, \$100 and 35,000 miles for a set of tires, and \$15,000 and 100,000 miles for a car, that adds up to \$320,400 saved.

Add to that the more intangible benefits to our local environment and our health. Using figures for an average single-occupancy passenger car, the Meyerland carpool has avoided the generation of 784 tons of carbon dioxide which is the leading contributor to global warming; 31.5 tons of carbon monoxide; 4 tons of organic compounds, a contributor to smog; and 2.5 tons of nitrogen oxides, another smog element.

There is currently no system in place at JSC to match up potential car-poolers. Three or more employees working the same hours on-site may sign up for a reserved parking space for their carpool at the Security Customer Service Desk at Building 110.

For more details, call the JSC Security Branch at x37200.

JSC Safety Alert

Playing Sports During Lunchtime

What Happened

January 30, 1998, 11:55 a.m.
"I was hit by a soccer ball on my leg as I was walking from the cafeteria. I was not seriously hurt, but the potential exists for a serious injury at this site."

Results of the Investigation

This happened in the grassy area between Bldgs. 8 and 11. This is a high-traffic area during lunchtime and is not a good place to play soccer

What You Can Do

If you play sports at lunchtime, such as soccer or volleyball, please be considerate of non-participants in the area. Someone could easily be injured by a stray ball. To avoid injuring non-participants:

- Avoid high-traffic areas, such as those around the cafeterias.
- Stay as far away from sidewalks as possible.
- Be especially careful during strong winds.
- Watch for pedestrians in the area.

<http://www4.jsc.nasa.gov/safety/alert/>



JSC Photo by Leslie Eaton

GALLERIA GARDENING—Public Affairs Specialist Doug Peterson explains JSC efforts to use plants in recycling systems and as a source of food for future space travelers at the Galleria. JSC scientists Fred Smith, Yael Vodovotz and Dan Barta showcased samples of Mars and lunar soil simulants during "Primavera at the Galleria" on April 10 as a community outreach project.



JSC Photos by Ginger Gibson

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Sunshine, friendship, fun highlight JSC Family Picnic

Sell-out crowd gathers at Astroworld for annual center get together

Sunshine, barbecue and thrills were the name of the game at the April 5 NASA-JSC Family Picnic as a sell-out crowd took advantage of the opportunity to mingle with friends and experience the excitement of Astroworld.

JSC Employee Activities Association President Ginger Gibson said this year's picnic, the fourth in a row to be held at Astroworld, drew more than 3,000 NASA badged employees, retirees, contractors and their families and friends.

"It was an overwhelming success. We had a beautiful day, there was good food and great entertainment and Astroworld fun," said Gibson, who chaired this year's picnic committee.

Photographs show some of the fun that took place at Astroworld's A&W Ranch, where JSC workers gathered to

enjoy barbecue and each other's company, play horseshoes or volleyball and listen to music. In addition, those who made it to the ranch received free complimentary passes for another visit at Astroworld later this year.

1 – The Texas Wildflower a cappella singers, provided by the Houston Livestock Show & Rodeo speakers committee, croon to folks at the A&W Ranch from on stage.

2 – A young picnic-goer gets a face painting by one of the Astroworld Arts artists. Children of all ages received removable adornments ranging from flowers to rocket ships throughout the day.

3 – Sylvester welcomes picnickers to the A&W ranch. He was just one of the Warner Brothers characters on hand.

4 – Members of the Houston Livestock Show & Rodeo dance team

display the latest steps and teach them to anyone brave enough to try. Country dancing was available for those who hadn't twirled too much already on the amusement park's rides.

5 – A melodrama put on by the Houston Livestock Show & Rodeo players draws intense concentration from youngsters, joined on the floor by a rodeo clown.

6 – Whether in sunshine or shade, JSC employees enjoy a barbecue meal and a cold drink as they take a break from the whirlwind of Astroworld rides.

7 – Leti Fenner displays a smiling face and a balloon animal, both common sights at the picnic.

8 – Twin Astronauts Mark and Scott Kelly sign autographs for a line of eager picnickers. Fellow Astronaut Jim Reilly worked the earlier shift with the autograph pen.

9 – Thufferin' thuccotath, it'th a thurprith! A young picnicker gets a big surprise from a large, furry character.

10 – The melodrama's good guy, holding his white hat, tells the tale as the troupe exhibits its musical, dramatic and sartorial talents on the A&W stage.

11 – Several of the Melodrama players give a sidelong glance to the audience during a performance that involved an Old West shoot out, a dastardly villain (shown here with a dastardly mustache), a damsel in distress and, of course, a hero.

12 – Sylvester kisses the hand of picnic coordinator Ginger Gibson.

13 – Picnic volunteer Susan O'Keefe, left, and picnic organizers, from left, Melody Nation, Dick McMinimy, Mavis Ilkenhans, Norma McMinimy and Steve Fernandez keep track of the activities as the fun continues around them. □



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13 Years Ago at JSC

Despite a hard-pressed repair attempt, fixing Syncom IV-3 was not in the cards

Excerpts reprinted from the May 3, 1985 issue of the Space News Roundup.

There were times during STS 51-D, Commander Bo Bobko said, when trips to *Discovery's* teleprinter reminded him of TV's Mr. Phelps, the silver-haired man who had weekly sessions with a tape recorder as leader of the Impossible Missions Force.

This mission was to have been a routine deployment flight, dropping off a Telesat satellite for Telesat Canada and a Syncom IV satellite for Hughes Communications.

When Syncom IV-3 slid out of *Discovery's* payload bay April 13, however, the pre-mission plans went out with it. For reasons still not clearly understood, Syncom failed to activate according to a prescribed sequence of events.

The crew observed this lack of activity as the Syncom moved away at 1.5 feet per second. "Houston, we are watching the Syncom, and the omni antenna is still down," radioed Mission Specialist Rhea Seddon. As Syncom continued a slow roll through space, engineers on the ground tried to understand the failure mechanism.

NASA and Hughes went into a troubleshooting mode: Hughes to try and diagnose Syncom's problem, NASA to study methods by which the crew might attempt any fixes. The arming lever was among the most likely sources of the problem.

Equipment duplicating the arming lever and related mechanisms was flown in from the Hughes plant in California that afternoon, while at JSC, work began to build a scale replica of the satellite.

By Saturday afternoon, a series of meetings had begun that would continue for the next four days.

By Sunday, JSC was a hotbed of activity. Robert Crippen and Rick Hauck flew rendezvous runs in the

Shuttle Mission Simulator; Jerry Ross and Woody Spring practiced EVA possibilities in the Weightless Environment Training Facility; Pinky Nelson and Bruce McCandless, fully suited in 1G, practiced pulling at the lever as a mock Syncom was twirled at 2 rpm from a rolling crane in Bldg. 9A. During the day, a wide assortment of flown astronauts and flight controllers passed in and out of the MOCR and the rooms in Bldg. 30 where ideas were discussed and evaluated, and then discarded or built upon.

By 6 p.m. Sunday, the Mission Management Team decided not to exercise any option which would involve placing an astronaut in any close proximity to Syncom—in other words, no astronauts at the end of *Discovery's* robot arm, being maneuvered between a 210,000 pound orbiter and a 14,000 pound slowly spinning satellite. This did not, however, rule out an EVA entirely, nor at the time, did it rule out an astronaut effecting the repair.

The teams studying the problem began fashioning a tool which could be used to snag the activation lever. A call went out for controllers to look through their list of materials packed aboard *Discovery* for something long, such as aluminum tubing, which could be fashioned into a snare 12 or 15 feet long. Perhaps a crewman could wield the snare, or it could be attached to the robot arm. The EECOM assessment showed the handhold rails along the front of the Continuous Flow Electrophoresis System and tubing from the treadmill aboard for crew exercise as possibilities. Total tubing length: about 12 feet.

Planning continued Monday morning, and it was during this period that the "flyswatter" was born. The leading plan was to fashion a tool from materials in the cabin, attach the tool to the RMS during an EVA, then close on

Syncom the following day. This was no small task. The raw data used to come up with a design went something like this: Something must snag Syncom's activation lever with 5 to 10 pounds of force and that something must be attached to the RMS; the satellite weighs two tons, and all of that mass is spinning at 2 rpm; the tool must snag the lever with enough force to move it, but must be weak enough to give way, so as not to damage the RMS. It then remained for the ground team to come up with materials on hand which could be assembled into a useable tool through instructions relayed either by voice, teleprinter, or both. The Great Flyswatter Design Effort was on.

The flyswatter's basic components consisted of a "swizzle stick", an aluminum rod used to throw hard to reach circuit breakers, the triangular-shaped suction tip from the orbiter's vacuum cleaner, pieces of plastic from Flight Data File covers, wire and lots of tape. By Monday, a second flyswatter design had been contributed. That design called for extracting stays from an interdeck sunshade, clipping one end to form a U-shaped brace, then notching the open end and attaching a slotted piece of plastic to it.

Tests then had to be performed on the homemade tools to determine how they would hold up in the vacuum and extreme temperatures of space. As those tests were under way, a third design called the lacrosse stick was developed as a backup to the first two. This used the same shade stay for its basic structure, but the business end was a loop of teflon coated wire, instead of plastic.

Instructions for flyswatter construction were teleprinted up to the crew. The Flight Activities Officer and their teams were put to the test as they constructed messages which would make sense of the intricate fabrication techniques. To the FAOs fell such tasks as



JSC Photo S85-30862

Orbit 1 team Flight Director John Cox explains the flyswatter to the news media at his daily press conference.

drawing an arming lever diagram with X's and O's.

As each of these efforts led toward Tuesday's EVA, the crew spent the better part of Monday afternoon building flyswatters and lacrosse sticks. "This has really been an interesting day," Mission Specialist Jeff Hoffman said at one point. "We had toys this morning, and arts and crafts this afternoon."

As the EVA approached, attention began to shift from tests on the ground to the real thing in space. "The EVA plan is definitely free form," Lead Flight Director Randy Stone told reporters at his daily news conference. Later he said, "the only way we had a snowball's chance of pulling any of it off was taking it in a very relaxed manner. We had to do the EVA one step at a time, then go on to the rendezvous."

Thus on April 16, astronauts Hoffman and David Griggs cracked the hatch and stepped out into the payload bay, for the first contingency EVA in shuttle history, carrying with them three makeshift tools. The space walk went well. Now it was up to Bobko and Williams to fly *Discovery* back to Syncom, and up to Seddon to attempt a snag with the robot arm.

Early Wednesday morning, *Discovery* closed the distance with

Syncom and came up from behind and beneath the satellite.

On the descending node of Orbit 79, just past the equator over the Atlantic Ocean, it was all up to Rhea Seddon. A six-minute window opened. Seddon moved the arm in slowly, and made the first snag attempt about 1 minute 45 seconds into the window. At 2 minutes 30 seconds she made contact with a flyswatter and it ripped away as expected. About 30 seconds later she tried again, catching the lever with the lacrosse stick. Almost four minutes into the window, she hit the lever a third time with the hard cone-shaped base of a flyswatter.

At six minutes into the window, CapCom Dave Hilmers radioed the crew, "*Discovery*, the window is closed. Perform separation maneuver."

Slowly, the ship moved off, leaving Syncom still spinning, albeit somewhat slower. The satellite had failed to activate, but not for want of extensive effort, one likened to the efforts to salvage Skylab, and before that, to save the Apollo 13 crew in far more difficult circumstances.

In the end, it was, in Bobko's words, "a demanding, challenging and extremely exciting spaceflight. It was JSC at it's finest."

Gilruth Center News

Hours: The Gilruth Center is open from 6:30 a.m.-10 p.m. Monday-Thursday, 6:30 a.m.-9 p.m. Friday, and 9 a.m.-2 p.m. Saturday.

Sign-up policy: All classes and athletic activities are on a first come, first served basis. Sign up in person at the Gilruth Center and show a yellow Gilruth or weight room badge. Classes tend to fill up two weeks in advance. Payment must be made in full, in exact change or by check, at the time of registration. No registration will be taken by telephone. For more information, call x30304.

Gilruth 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.

Nutrition intervention program: Would you like to learn more about the role diet and nutrition play in your health? This six-week program includes lectures, a private consultation with the dietitian and blood analysis to chart your progress. 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 at the Gilruth Center. Pre-registration required. Cost is \$25. Call for next available class.

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

Weight safety: Required course for employees wishing to use the Gilruth weight room. The next classes are scheduled for at 8 p.m. Apr. 9 and 23 (must be on time to receive credit for class). 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 eight weeks.

Aikido: Introductory martial arts class meets from 5:15-6:15 p.m. Tuesday and Wednesday. New classes begin the first of each month. Instruction is by a fourth-degree black belt. Cost is \$35 per month.

Step/bench aerobics: Low impact cardiovascular workout. Classes meet from 5:15-6:15 p.m. Monday, Tuesdays and Thursdays. Cost is \$32 for eight weeks. Call Kristen Taragzewski, instructor x36891.

Yoga: Stretching Class. Low impact exercises designed for people of all ages and abilities in a Westernized format. Thursdays 5-6 p.m. \$32 for eight weeks.

Ballroom dancing: Classes meet from 7-8:15 p.m. Thursdays for beginner advanced classes and from 8:15-9:30 p.m. for beginner-intermediate and intermediate students. Cost is \$60 per couple.

Country and western dancing: Beginner class meets 7-8:30 p.m. Monday. Advanced class (must know basic steps to all dances) 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

Building 3 Exchange Store hours are 7 a.m. - 4 p.m. Monday - Friday.
Building 11 Exchange Store hours are 9 a.m. - 3 p.m. Monday - Friday.
For more information, please call x35350.

The following discount tickets are available at the Exchange Stores:

General Cinema Theaters	.....	\$ 5.50
Sony Loew's Theaters	.....	\$ 5.00
AMC Theaters	.....	\$ 4.75
Astroworld Early Bird Tickets (valid thru 5/31)	.....	\$18.50
Astroworld One Day Admission	.....	\$24.25
(valid at all Texas Six Flags Theme Parks)		
Astroworld Season Pass	.....	\$57.75
(valid at all Texas Six Flags Theme Parks and Water World)		
Moody Gardens (2 of 6 events)	.....	\$ 9.75
Sea World	.....adult \$27.25 ..child (3-11)	\$18.25
Schlotterbahn	.....adult \$20.75 ..child (3-11)	\$17.50
Space Center Houston	.....adult \$10.25 ..child (4-11)	\$ 7.00

Metro Tokens and value cards available.

Coming Soon:
Splashtown Water Park and Houston Comets Tickets.
Book Fair - May 5-7.

Roundup Deadlines

The Space News Roundup is published every other Friday. Story ideas should be submitted as far in advance as possible, but no later than two weeks prior to the date of publication.

The deadline for Dates & Data calendar items is three weeks prior to the date of publication. Stories and ideas should be submitted to Editor Kelly Humphries in Bldg. 2, Rm. 180, or via e-mail to kelly.o.humphries1@jsc.nasa.gov.

Retirees should submit change of address notices to the distribution group at Mail Code BT552 or call Ignacia Ramirez at 281-483-6161.



Lauren Metz patiently awaits her balloon creation from "elastic engineer" (sic) Jeff Rogganbuck at the annual Easter egg hunt held at the Gilruth center. Festivities included an Easter egg hunt, face painting, a petting zoo, horseback rides, a magic show, balloon toys, photos with the Easter Bunny and lots of candy.

Hartman, Johnson receive Rotary Award

Harvey Hartman, JSC director of human resources, and Sandy Johnson, president and owner of Barrios Technology Inc., have been named recipients of the Vocational Excellence Award of the Space Center Rotary.

Hartman develops and manages a program which supports 3,400 Civil Service positions and all of JSC's programmatic, scientific, engineering and administrative functions. The rotary said his team "has built a reputation for excellence which is unequaled in NASA and recognized throughout the government for its customer and service orientation, innovative practices and quality products."

He also was cited for his personal commitment to youth and to the future of his community and the

national. He represents JSC on the Clear Lake Economic Development Foundation and is involved in the National Management Foundation.

The rotary noted that Hartman also participates in the Christian Care Network and the Small Group Care Ministry of the Gloria Dei Lutheran Church, where he teaches Sunday school and is on the board of directors and the building committee.

Johnson was among the original group of stockholders who formed Barrios Technology in 1980, the year the company won the Flight Design Support Services Contract. As the company grew, she assumed positions of increasing responsibility. In 1993 she acquired a majority interest in Barrios Technology.

She was cited for her commitment to excellence and her attention to employees, customers and the community. "Sandy is truly a unique individual noted for her balanced combination of technical capability, business acumen, wisdom, belief in community involvement and support for her employees and family," the Rotary said.

She guided Barrios Technology, which employs about 300 people, in a resurgence from declining revenues. The company won major contracts which resulted in a 100 percent increase in gross revenues over the last two years.

Hartman and Johnson each will receive a plaque from Space Center Rotary, and names of both will be submitted as nominees for Rotary District 5890 honors.

People on the Move

Human Resources reports the following personnel changes as of April 11, 1998:

Key Management Assignments

Barbara Zelon joins the Public Affairs Office as Director of Public Affairs.

Additions to the Workforce

Barbie Haberer joins the Human Resources Office as a secretary.

Carole Liss joins the Supply and Materials Branch in the Center Operations Directorate as a secretary.

Promotions

David Culp was selected as a contracting officer in the Space and Life Sciences Business Management Office.

Teri Larison was selected as the secretary of the Facility Development Division in the Center Operations Directorate.

Cindy Meza was selected as the secretary of the Space Shuttle Program Integration Office.

Reassignments Between Directorates

Jan Read moves from the Phase 1 Program Office to the Business Management Directorate.

Barbara Corbin moves from the Business Management Directorate to the Mission Operations Directorate.

Sam Daugherty moves from the Safety, Reliability, and Quality Assurance Office to the Engineering Office at the White Sands Test Facility.

Reassignments to Other Centers

Candy Hosea of the Flight Crew Operations Directorate moves to the Kennedy Space Center.

Rex Delventhal of the International Space Station Program Office moves to the Lewis Research Center.

Resignations

Tony Wagner of the Engineering Directorate.

Cindy Nebrig of the Business Management Directorate.

Mission control open for viewing during STS-90

The Mission Control Center viewing room will be open for JSC and contractor badged employees and their families during portions of the STS-90 mission.

Employees will be allowed to visit the MCC:

April 24 - 1-3 p.m.

April 25 - 11 a.m.-1 p.m.

April 26 - 11 a.m.-1 p.m.

April 27 - 3-5 p.m.

April 28 - 4-6 p.m.

April 29 - 2-4 p.m.

April 30 - 4-6 p.m.

May 1 - 11 a.m.-1 p.m.

May 2 - 1-3 p.m.

Employees must wear their badges at all times and escort family members through the doors on the South side of Bldg. 30 marked, "Entrance to Mission Control Center viewing room". Once inside, take the elevator to the second floor viewing room.

While in the viewing room, the following requirements must be observed: Children under five will not be permitted. **No cameras or recording devices will be permitted at any time.**

Because of the dynamic nature of shuttle missions, viewing hours may be changed or canceled without notice.

At this time, the Mission Control Center viewing room will not be open to employees during landing.

For the latest information on the schedule, call the Employee Information Service at x36765.

Newberry named acting director

Stan C. Newberry has been named Acting Director, Space Operations in the Space Operations Management Office.

Newberry brings more than 10 years of experience in progressively responsible managerial positions at the Kennedy Space Center and NASA Headquarters.

Since September 1996, Newberry has served as manager of

the Resources and Management Office in SOMO.

Newberry earned a Bachelor of Business Administration degree in Marketing from Georgia College and a Master of Business Administration degree from the University of Central Florida.

Newberry replaces John O'Neill, who retired after 38 years of Federal service.

Employees build models for Bush Library

A story in the April 10 issue of the Space News Roundup discussed airplane models that were built for the George Bush Library. After the article went to print, we found other JSC employees were involved in the project. Ed Morrison, formerly with Grumman,

Jim McLaughlin, currently with GB Tech and John Rivers, in the flight planning and tool development group also are members of the Galveston Bay Area Scale Modelers Association and built 'Avenger' and 'Hellcat' models for the library display.

Dates & Data

April 25

NSBE meets: The National Society of Black Engineers- Houston Alumni Extension is hosting its First Annual Scholarship Luncheon at 11:30 a.m. on Saturday, April 25 at Brady's Landing. For those that are interested in attending, please contact Sabra Crawford at 333-7028 for tickets.

April 26

HBO Party: The Clear Lake Chapter of the National Space Society is sponsoring another HBO "From the Earth to the Moon" party at 6 p.m. April 26 at Damon's in the Radisson Hotel. Episode 7, "That's All There Is" and episode 8, "We Interrupt This Program" of Tom Hank's miniseries "From the Earth to the Moon" will be shown. Four big-screen televisions will be set up for the event. The party is free of charge and open to the public.

April 29

Spaceland Toastmasters meet: The Spaceland Toastmasters will meet at 7 a.m. April 29 at the House of Prayer Lutheran Church. For more information, call George Salazar at x30162.

Communicators meet: The Clear Lake Communicators will meet at 11:30 a.m. April 29. For information and location, contact Henry Duke at 280-4403 or Melissa Sommers at 332-0698.

Spaceteam Toastmasters meet: The Spaceteam Toastmasters will meet at 11:30 a.m. April 29 at United Space Alliance, 600 Gemini. For details, call Chuck Kubricht at 282-3908 or Brian Collins at x35190.

Astronomers meet: The JSC Astronomy Seminar will meet at noon April 29 in Bldg. 31, Rm. 129. An open discussion meeting is planned. For more information, call Al Jackson at x35037.

April 30

Radio Club meets: The JSC Amateur Radio Club will meet at 6:30 p.m. April 30 at the Piccadilly, 2465 Bay Area Blvd. For more information, call Larry Dietrich at x39198.

May 5

The American Society for Quality will meet at 6 p.m. May 5 at the Ramada King's Inn on NASA 1. A video tutorial about statistics will be shown at 5:15 p.m. Dinner is at 6 p.m. and costs \$9. The program

begins at 7p.m. Everyone is welcome to attend. For more information, contact Ann Dorris at x38620.

May 6

Spaceland Toastmasters meet: The Spaceland Toastmasters will meet at 7 a.m. May 6 at the House of Prayer Lutheran Church. For more information, call George Salazar at x30162.

Communicators meet: The Clear Lake Communicators will meet at 11:30 a.m. May 6. For information and location, contact Henry Duke at 280-4403 or Melissa Sommers at 332-0698.

Spaceteam Toastmasters meet: The Spaceteam Toastmasters will meet at 11:30 a.m. May 6 at United Space Alliance, 600 Gemini. For details, call Chuck Kubricht at 282-3908 or Brian Collins at x35190.

Astronomers meet: The JSC Astronomy Seminar will meet at noon May 6 in Bldg. 31, Rm. 129. Dr. A.A. Jackson will speak on asteroid and comet impact hazards to the Earth. For more information, call Al Jackson at x35037.

May 7

SSQ meets: The Society for Software Quality will meet at 6:45

p.m. May 7 at the Holiday Inn on NASA Rd. 1. Registration and social begin at 5:30 p.m. with dinner at 6 p.m. The speaker is Lee Snapp, JSC computer security manager. The topic will be computer security. To make a reservation, call Herb Babineaux at x34263.

Airplane club: The MSC Radio Control Airplane Club will meet at 7 p.m. May 7 in the Clear Lake Park building. For more information, call Bill Langdoc at x35970.

May 8

Space Society meets: The Clear Lake chapter of the National Space Society will meet at 6:30 p.m. May 8 at the Radisson Hotel, 9100 Gulf Fwy. in the Deer Park room. Dr. Kenneth Cox, assistant to the director, engineering directorate, will speak on "A Futurist' Perspective for Space." For more information, call Murray Clark at 367-2227.

Astronomers meet: The JSC Astronomical Society will meet at 7:30 p.m. May 8 at the Center for Advanced Space Studies, 3600 Bay Area Blvd. Jim Morrison will speak on celestial time keeping. For more information, call Chuck Shaw at x35416.

May 12

NPMA meets: The National Property Management Association will meet at 5 p.m. May 12 at Robinette and Doyle Caterers, 216 Kirby in Seabrook. Sinner costs \$14. For details, call Sina Hawsey at x36582.

Aero club meets: The Bay Area Aero Club will meet at 7 p.m. May 12 at the Houston Gulf Airport clubhouse at 2750 FM 1266 in League City. For details, call Larry Henderson at x32050.

May 13

Spaceland Toastmasters meet: The Spaceland Toastmasters will meet at 7 a.m. May 13 at the House of Prayer Lutheran Church. For additional information, call George Salazar at x30162.

Communicators meet: The Clear Lake Communicators will meet at 11:30 a.m. May 13. For information and location, contact Henry Duke at 280-4403 or Melissa Sommers at 332-0698.

Spaceteam Toastmasters meet: The Spaceteam Toastmasters will meet at 11:30 a.m. May 13 at United Space Alliance, 600 Gemini. For additional information call Chuck Kubricht at 282-3908 or Brian Collins at x35190.

NASA Briefs

Bring Our Children to Work Day set

Recognizing the importance of children experiencing their parents' work environment, JSC has designated June 12 as Bring Our Children to Work Day and encourages all parents/sponsors to bring their children on that day. The Clear Creek Independent School District Board of Trustees voted to not participate in the official event. The Board determined that students lost a day of instruction, and it was in the students' best interests to cancel this event for their school district. JSC opted to sponsor the program during the summer because of the large number of students who would be unable to attend on the officially designated BOCTW Day. Parents, sponsors, and students are encouraged to attend either a morning or afternoon session at the Gilruth Center, and students will be able to purchase lunch for half-price at both JSC cafeterias. Additional details will be provided as they become available.

NASA opens contest to name observatory

NASA is searching for a new name for the Advanced X-ray Astrophysics Facility, currently scheduled for launch Dec. 3, from the Space Shuttle *Columbia*. AXAF is the third of NASA's Great Observatories, after the Hubble Space Telescope and the Compton Gamma Ray Observatory.

Entries should contain the name of a person (not living), place, or thing from history, mythology, or fiction and should describe in a few sentences why this choice would be a good name for AXAF. The name must not have been used before on space missions by NASA or other organizations or countries. Contest rules, electronic entry forms, and additional information can be found on the Internet at: <http://asc.harvard.edu/con-test.html>.

Deep Space 1 launch reset to October

The planned July launch of NASA's Deep Space 1 technology validation mission from Cape Canaveral, Fla., has been rescheduled for October.

The delay is due to a combination of late delivery of the spacecraft's power electronics system and an ambitious flight software development schedule, which together leave insufficient time to test the spacecraft thoroughly.

Deep Space 1 is the first launch in NASA's New Millennium program, a series of missions designed to test new technologies so that they can be confidently used on science missions of the 21st century.

Domain password security to be increased at JSC

(Continued from Page 1)

users will be prompted to change their passwords. Procedures to help users through the process can be found on the JSC Home Page at URL: <http://www4.jsc.nasa.gov/infosys/NTPass/>.

Sometime between May 5 and the end of August every user's JSC NT Domain password will expire (maybe more than once) and they will need to know how to change it," said Jennifer Rasnic of the Information Systems Directorate. "Then, their password will expire every time it gets older than 90 days. This is not a short term project—it will continue to affect them on a regular, recurring basis. We have done our best to provide training sessions for points-of-contact in the organizations, created a web site with step-by-step instructions,

and are trying to get the word out to everyone through as many avenues as possible."

Passwords provide authentication of computer users logging on to JSC systems; they help ensure that you really are who your ID says you are and protect the government's data. In today's world, however, the number of computer security threats is increasing and the JSC user environment is changing rapidly. By changing passwords regularly at JSC, it will improve the security of our authentication process.

"Our best advice to anyone is to follow the instructions and change your password now," Rasnic said. "Then, set yourself a reminder to change it every 89 days from now on. That is the easiest, simplest method to follow and causes the least amount of work to synchro-

nize your passwords with other systems like Novell and the Windows password."

The oldest accounts where the password has not been changed in years (990 days old or greater) will expire first then the process will work its way down until the 90 day mark is reached, said John Gillman, manager of the Information Systems Contract Operations Center, which is responsible for local area network operations.

The minimum password length is six characters, and the maximum is 14 characters. Users who also work on Novell NetWare servers should keep in mind for synchronization purposes that most of those systems have a maximum password length of eight characters. Passwords are case sensitive, make sure your CAPS LOCK is turned off. Users

should choose unique passwords. Once password expiration is implemented, the system will remember your previous 24 passwords. Therefore you will not be able to reuse a password until the 25th password change. Combinations of letters and numbers are recommended.

If you have questions or concerns, contact your organization's IRM Steering Council representative or Computer Security Official. A list of IRM Steering Council representatives can be found from the CIO page at URL: http://jsc-cio-01.jsc.nasa.gov/irmc/irmc_members.htm, and a list of CSO's can be found from the Computer Security page: <http://www4.jsc.nasa.gov/org/ga/itsecurity/>.

The Information Technology Operations Center "Help Desk" also will be available at x34800.



Over 40 volunteers from JSC turned out to do their part in cleaning up the environment at the fifth annual Rivers, Lakes, Bays 'N Bayous Trash Bash. Volunteers from the area joined together to clean up a section of Clear Lake near the Kemah Bridge.

Control tower simulator studies airport safety, traffic problems

NASA has begun construction of a full-scale air traffic control tower simulator that will provide—under realistic airport conditions and configurations—a facility that will test ways to combat potential air and runway traffic problems at commercial airports.

Researchers will look primarily at the feasibility, safety, reliability and cost benefits of technologies prior to incorporating them into airports. Testing also will provide information that may assist in developing proposed changes to airport ground procedures and on construction of new airport facilities.

"This will be the only one of its kind in the world," said Stan Harke, project manager at Ames Research Center. "It will allow the commercial aviation industry to study and correct potential problems in a safe setting before they become actual problems. This will be as real as it can get," he added.

Jointly funded by NASA's Advanced Air Transportation Technologies Office and the Federal Aviation Administration, the \$9.3 million, two-story building, called the Surface Development and Test Facility, is being built at Ames.

"We will be able to simulate any

airport in the world," said Nancy Dorigi, deputy project manager at Ames. "The three-dimensional visual database of the airport will be viewed through the 360-degree window of the simulator. The visual scene, along with specific airport traffic patterns and operating procedures, will give us a very credible simulation capability."

The tower cab will have reconfigurable site-specific displays, such as terminal area radar, surface radar and weather, installed based on FAA specifications. Twelve rear-projection video screens will provide a seamless 360-degree high-resolution view of the airport or other scenes being depicted.

These image generators will provide a realistic view of weather conditions, environmental and seasonal effects and the movement of 200 or more active aircraft in the air or on the ground.

The imaging system will be powered by supercomputers and the remainder of the simulation by approximately 100 Pentium processors. Video cameras will record air traffic controllers' activities for human factors research.

The facility is scheduled to begin testing operations in 1999.

Clinton voices strong support for NASA

(Continued from Page 1)

left our footprints on the Moon, explored the surface of Mars, completed 89 space shuttle missions, orbited Earth for 755 days, 12 hours, and 44 minutes. When the 90th mission lifts off into space this Thursday, 238 Americans will have had the chance to see the stars up close and to work with dedicated people from other nations who share the same goals and dreams of a peaceful cooperative future."

During the visit, Clinton also met with NASA Administrator Daniel S. Goldin, JSC Director George Abbey and Houston Mayor Lee Brown, and toured space shuttle and International Space Station mockups in Bldg. 9. Clinton credited Goldin's leadership with allowing the agency to accomplish its objectives in the face of financial austerity.

"Since 1993, productivity at NASA has increased by 40 percent, new spacecraft are being built in half the time at much less cost," Clinton said. "That is something you can be proud of. In the 1980s we launched just two solar system exploration missions. This year we're on schedule to launch a spacecraft every 10 weeks. I am committed to maintaining a strong, stable, balanced space program. Our balanced budget will support 28 new space missions, missions that will help us decipher more of the mysteries of black holes and ancient stars, and of Earth and, indeed, life itself."

Clinton discussed mission activities with the crew of STS-95, including Sen. John Glenn, and David Wolf, who returned to Earth recently after four months aboard the Russian Mir Space Station. The president said he supports Goldin's decision to allow Glenn to fly on STS-95 with Commander Curt Brown and his crew.

"We thought it would be good for the space program, good for science, good for the American people, good for our future. We are living longer than ever before, as Americans. It is imperative that we live healthier than ever before," he said, "it is imperative

that we learn as much as we can about the aging process."

Clinton said the world's spacefaring nations are leaving behind their national differences and seeking scientific knowledge for the benefit of humanity and called U.S.-Russian cooperation in space an important example.

"Soon the International Space Station will be launched, the size of a football field, so large it will actually be visible to the naked eye here on Earth. Yes, as Mr. Goldin alluded, it was a fight for a while and there were those who thought we should abandon it, but we did not abandon it, and 10 or 20 years from now people will wonder that we ever even considered such a thing because we will all, before long, be thanking our lucky stars that we had the vision to work with people from around the world to setup the International Space Station in the sky. From it we will explore vast new frontiers, chart unexplored seas, reach a little deeper in to the vast final frontier," Clinton said.

During his call to the STS-90 crew in Florida, the President joked that as he gets older he is beginning to experience the same routine health difficulties faced by many Americans, such as dizziness, and told the Neurolab astronauts he expects them "to come back with all the answers."

"The space program has enormous potential to change life here on Earth for the better in a health way, in the way that you're exploring, in environmental ways, and in other ways as well, so this is a particularly exciting mission to me because I believe it will help to strengthen the support of the rank and file Americans for our NASA operations generally, and I'm very grateful to you," he told Commander Rick Searfoss and company. "Good luck and have a great time out there."

Clinton applauded JSC employees' unwavering commitment to the space program and urged them to keep the faith as the new millennium begins.

Neurolab focuses on adaptation

(Continued from Page 1)

The crew was accompanied by 42 rats, 18 pregnant mice, 8 fish, 60 snails and 624 crickets, which are being used to study how developing nervous systems are affected by the absence of gravity.

In interviews with reporters on the ground, Searfoss and his crew reported that the experiments were going well.

Early in the flight, crew members did have to perform maintenance work on two experiments. A pump supplying air to four oyster toadfish failed in the Vestibular Function Experiment Unit, but Hire and Altman were able to route air from another of the unit's four chambers. Linnehan and Pawelczyk replaced a hard drive on the computer controlling a ball-drop experiment

designed to follow their nerve impulses and the ball launcher performed normally.

The crew members will work with a total of 26 experiments in eight different areas of research into how the brain and nervous system—the most complex and least well-known parts of the human body—function. Some of the tests were designed to study well-documented sleep difficulties experienced by astronauts on orbit.

The international team of researchers is interested in solving these puzzles so that they can develop strategies for helping humans live and work in space for longer periods, and because much of the research has applications that could help human patients with nervous disorders on Earth.

Space News **ROUNDUP!**

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The Roundup office is in Bldg. 2, Rm. 181. The mail code is AP3. The main Roundup telephone number is x38648, and the fax number is x45165. Electronic mail messages may be directed to kelly.o.humphries1@jsc.nasa.gov or leslie.eaton1@jsc.nasa.gov.

Editor Kelly Humphries
Associate Editor Leslie Eaton

NASA finds problem with satellite software

NASA has found problems with software required to control, monitor and schedule science activities on the Earth Observing System series of spacecraft.

Officials believe these problems will delay the launch date for the Earth Observing Spacecraft AM-1. The launch, originally planned for late June from Vandenberg Air Force Base, Calif., will be delayed at least until the end of the year.

The problem is with the control center system software that supports the command and control of spacecraft and instruments, the monitoring of spacecraft and instrument health and safety and the analysis of spacecraft trends and

anomalies.

What was supposed to have been the final version of the software was delivered to NASA by Lockheed Martin on March 31, to support integrated simulations with the EOS AM-1 spacecraft.

Testing of this software revealed significant performance problems. Program managers expect it to take several weeks to clearly understand whether correcting the current software or taking other measures is the best approach.

Government/contractor teams have been formed to evaluate options for correcting these problems to minimize impact on the AM-1 launch.