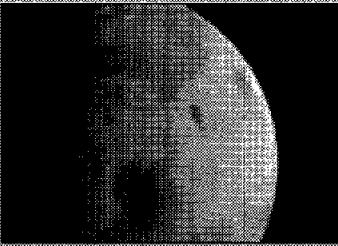


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Mars Global Surveyor paves the way for future exploration activities.

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United Space Alliance's Logistics Support Facility achieves safety milestone.

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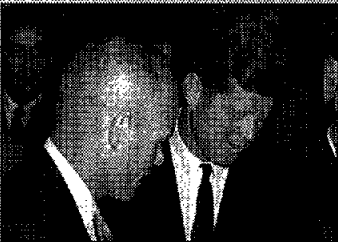
STS-86 crew members prepare for *Atlantis*' final Mir docking mission.

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Astronaut Dave Wolf says he's ready for four-month stay aboard Mir.

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President John F. Kennedy visited the Manned Spacecraft Center 35 years ago.

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The daughter of a White Sands worker earns JSC Exchange Scholarship.

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## Atlantis delivering Wolf to Mir, returning Foale

Seventh docking mission includes first joint shuttle-based space walk

By Kyle Herring

Space Shuttle *Atlantis* was set to begin its seventh and last visit to the Russian Space Station Mir last night with launch at 9:34 p.m. CDT. An on-time launch would have the orbiter docking with Mir at about 4:30 p.m. CDT Saturday.

The seventh of nine planned docking missions was timed such that *Atlantis* would launch almost directly into the same plane as Mir to maximize the ascent performance of the orbiter, saving as much propellant as possible and demonstrating a capability that could be utilized on future International Space Station flights.

Mission Commander Jim Wetherbee, Pilot Mike Bloomfield, Flight Engineer Scott Parazynski, and Mission Specialists Vladimir Titov, Jean-Loup Chretien and Dave Wolf, who will replace Mike Foale aboard the station to continue the U.S. presence begun a year and a half ago, will make the seventh of nine planned missions to Mir and the fourth one involving an exchange of U.S. astronauts.

Foale, who has been on Mir since mid-May, will take Wolf's place aboard *Atlantis* for the remainder of the STS-86 mission. Wolf will then spend more than four months on the orbiting Russian facility, returning to

Earth on the next shuttle visit by *Endeavour* next January.

On the day of rendezvous, *Atlantis*' crew will fly a slightly modified profile for improved efficiency by aiming for a point 600 feet below Mir which allows natural forces to assist in braking the approach. At a distance of about 30 feet from Mir, Wetherbee will stop *Atlantis* to adjust the docking mechanism alignment, if necessary, and await a final go or no-go decision to proceed with the docking.

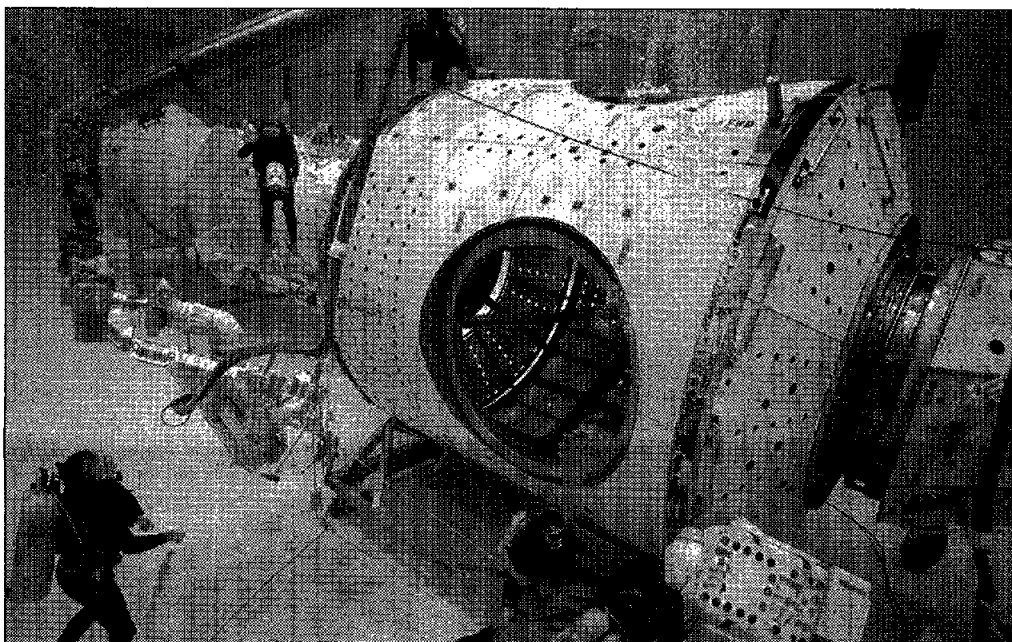
The hatches will be opened about 2 hours after docking to begin six days of joint operations between the shuttle crew and Mir Commander

Anatoly Solovyev, Flight Engineer Pavel Vinogradov and Foale.

Amid the transfer of about 8,000 pounds of logistical and resupply items, Parazynski and Titov will conduct a five-hour space walk on the fourth docked day to retrieve four suitcase-sized experiments called the Mir Environmental Effects Payload from the exterior of Mir's docking module. The experiments, attached by astronauts in March 1996, are measuring the effects of exposure to the space environment on a variety of materials.

In addition to transferring the MEEP back to *Atlantis*, Parazynski

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JSC Photo 97-11949 by Robert Markowitz

STS-88 Astronauts Jerry Ross and Jim Newman perform the first Sonny Carter Training Facility training session for three space walks they will conduct during the July 1998 flight, the first International Space Station assembly mission. During the six-hour training session, the crew practiced hooking up power and data cables between full-scale mockups of the Functional Cargo Block and the U.S.-built Node 1.

## Assembly space walk training begins

With launch only 10 months away, training is entering full swing for the first International Space Station assembly missions. Astronauts Jerry Ross and Jim Newman, who will perform the first space walks for station assembly in July 1998, participated in the first underwater training session for that flight Sept. 8 at the Sonny Carter Training Facility.

Ross and Newman will perform three space walks to connect power and data transmission cables between the connecting module Node 1, launched aboard *Endeavour* on STS-88, and the Russian-launched Functional Cargo Block to which Node 1 will

be attached. The FGB will be launched about two weeks before *Endeavour*'s flight.

The configuration in the Neutral Buoyancy Laboratory for Ross and Newman included full-scale cargo bay, Node 1 and FGB mockups. Ross and Newman practiced the first of three space walks, connecting cables between the node, pressurized mating adapter and FGB. Trainers said the session went well.

The second and third space walks on STS-88 will install handrails, remove restraints that were in place for launch, install an early S-band communications antenna and install tool boxes for future space walks.

## Mars Global Surveyor detects magnetic field

Scientists have confirmed the existence of a planet-wide magnetic field at Mars using an instrument onboard NASA's Mars Global Surveyor orbiter, as the spacecraft began to circle and study the planet from a highly elliptical orbit.

"Mars Global Surveyor has been in orbit for only a few days, yet it already has returned an important discovery about the Red Planet," said Vice President Al Gore. "This is another example of how NASA's commitment to faster, better, cheaper Mars exploration that began with Mars Pathfinder is going to help answer many fundamental questions about the history and environment of our neighboring planet, and the lessons it may hold for a better

understanding of life on Earth."

The spacecraft's magnetometer, which began making measurements of Mars' magnetic field after its capture into orbit on Sept. 11, detected the magnetic field on Sept. 15. The existence of a planetary magnetic field has important implications for the geological history of Mars and for the possible development and continued existence of life on Mars.

"Preliminary evidence of a stronger than expected magnetic field of planetary origin was collected and is now under detailed study," said Dr. Mario Acuna, principal investigator for the magnetometer/electron reflectometer instrument at NASA's Goddard Space Flight

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## Mir research harvest enters next season

NASA managers told a Congressional hearing last week that they are certain it is safe to continue the American presence aboard the Russian Mir Space Station, and that NASA is about to reap the most significant benefits yet from international cooperation.

Phase 1 Program Manager Frank Culbertson told the House Science Committee that as an astronaut who has flown in space, he is close to the astronauts who have been aboard Mir or are about to make the journey, as well as to their families.

"I take the safety of my friends very seriously and would not send anyone on something that I would not do myself," Culbertson said.

The hearing followed up on a report by NASA Inspector General Roberta Gross that raised some concerns about the safety of the aging space station.

Astronaut Dave Wolf, who was scheduled to launch Thursday on a mission that will include four months aboard Mir, said he and his Russian crew mates have been well-trained for their work aboard the station.

"We didn't start preparing last week or even last year for this," Wolf said in an interview last week. "I'm sure we can handle any reasonable emergency. Some of the worst have already occurred and, in fact, been handled quite well. I'm all go for this mission. It's time to go fly."

With three-fourths of the shuttle-Mir program nearly complete, science investigators and mission managers are preparing for the next phase of cooperative efforts that will lead to the most ambitious peacetime scientific project ever undertaken—the International Space Station. The next phase of shuttle-Mir includes more planned science experiments than any previous stay by a U.S. astronaut.

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WSTF Photo by Bill Gardner

**TOP BRASS, BIG DISH**—Beneath one of the 20-meter-diameter antennas at the Tracking and Data Relay Satellite System ground station, JSC Director George Abbey, JSC Associate Director John Young, New Mexico Sen. Jeff Bingaman and Rep. Joe Skeen, and others join NASA Administrator Daniel S. Goldin for his first visit to White Sands Test Facility. The group toured the nearby TDRSS complex Aug. 14 while in Las Cruces for the New Mexico Spaceport Summit meeting.

# NASA signs multi-agency agreement on spaceports

NASA, the Department of Defense and the Federal Aviation Administration have signed a joint agreement that provides guidance for federal interaction with commercial launch site operators on spaceports.

This joint agreement, signed by NASA Administrator Daniel S. Goldin, the Under Secretary of Defense for Acquisition and Technology and the Federal Aviation Administration Administrator, brings to fruition many months of concerted effort by the members of the Interagency

Working Group on Spaceports, which was initiated at the request of the White House Office of Science and Technology Policy.

A "spaceport" will be similar to an airport for rockets and will be managed by a launch site operator. Operation of a launch site consists of operations and maintenance of launch property, which must include at least one launch pad. These operators may be state government agencies, state-chartered or-sponsored entities, or commercial organizations.

The primary objective of the

agreement is to facilitate and encourage access by the private sector and state and local governments to excess federal launch property and services.

The agreement explains the respective roles and responsibilities of federal agencies in general, and specifically NASA, DOD and FAA, in their interactions with launch site operators. The intent is to minimize the regulatory burden on the U.S. commercial space sector by clearly delineating federal agency requirements and oversight responsibilities, eliminating overlap and duplication.

The guidance applies to current and prospective FAA-licensed launch site operators on, or outside, federal installations. It does not apply to operation of a launch site performed as part of a federal space activity carried out by, or for, the federal government.

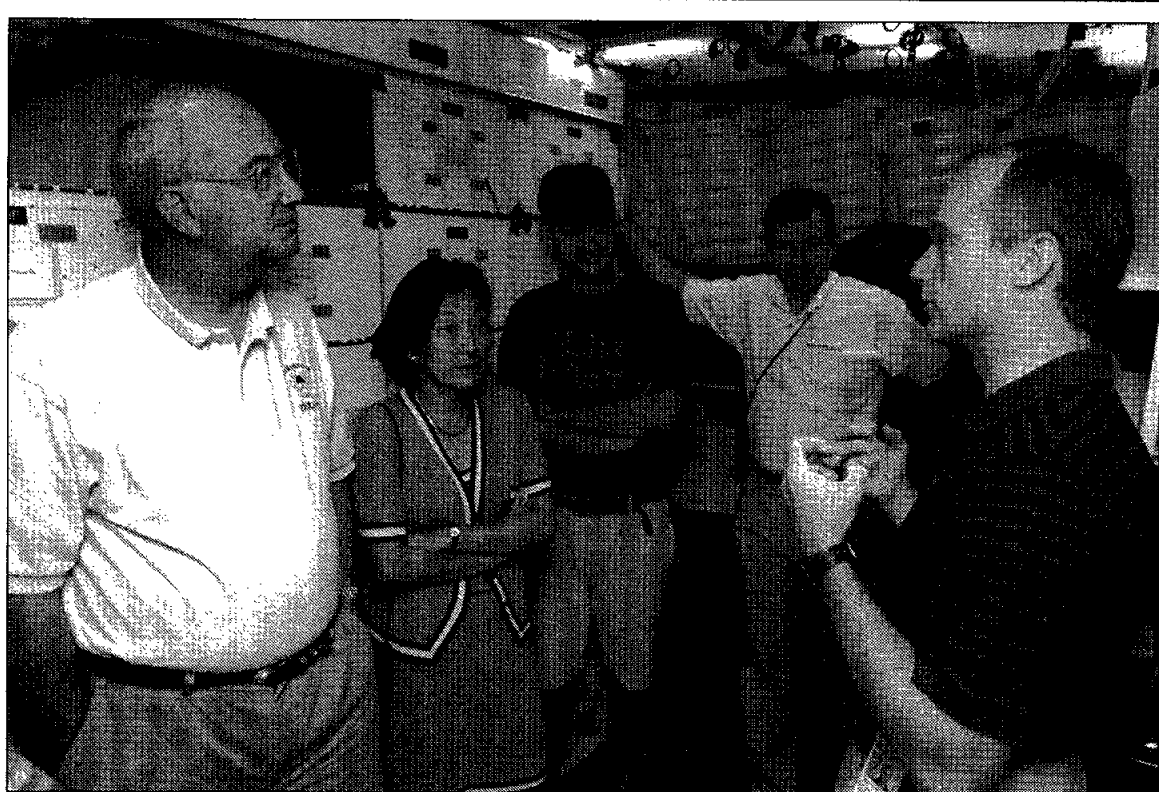
The basis of a federal license is the obligation to protect public health and safety. Federal guidance is provided in several areas:

- Environmental and safety compliance-licensing of launch site operators;
- Financial responsibility and

allocation of risk requirements applicable to activities conducted on a federal installation;

- Federal agency pricing for launch property and services;
- Foreign involvement in operation of a launch site;
- State government-related launch site operators; and
- Real property.

NASA, DOD, and FAA plan to use this agreement as a basis for writing implementation procedures to carry out their respective responsibilities in interacting with launch site operators.



JSC Photo S97-11639 by

**SENATORS' STATUS**—Sens. Phil Gramm, R-Texas, and John Ashcroft, R-Mo., talk with Astronaut Charlie Precourt about the workings of the space shuttle Full Fuselage Trainer during a visit to JSC this month. Gramm, left, was joined by his wife, Wendy, and son, Marshall, a graduate of Rice University. Ashcroft, just left of Precourt, brought along his son, Andy, who attends Rice (not pictured). Ashcroft is on the Senate Commerce, Science, & Transportation Committee. The group also received briefings on the International Space Station, the X-38 crew assured return vehicle being designed and constructed at JSC, and the Mission Control Center.

## Crews prepare three shuttles for flight

*Columbia* next in line for U.S. Microgravity Payload mission

By Kyle Herring

With *Atlantis* scheduled to be in orbit today, the rest of the space shuttle fleet is in full processing for a variety of missions to use the vehicles' capabilities.

*Columbia* is next in line for the STS-87 mission targeted for a mid-November launch.

The 16-day flight will include the deployment and retrieval of a science satellite and a space walk, all while multiple microgravity experiments are conducted remotely as part of the fourth flight of the U.S. Microgravity Payload, which consists of five pallet experiments and a separate acceleration measurement system to complement the payload.

The Spartan-201 satellite is designed to probe the physics of the solar wind acceleration region by measuring various structures.

The space walk by Winston Scott and Takao Doi will continue to demonstrate International Space Station on-orbit operations as well as end-to-end space walk assembly and maintenance tasks.

Kevin Kregel will command the STS-87 mission and Steven Lindsey will be the pilot. The other crew members are Mission Specialist Kalpana Chawla and Payload Specialist Leonid Kadenyuk.

The first mission of 1998 will be the eighth shuttle visit to Mir with *Endeavour* on the STS-89 flight to bring Dave Wolf home and drop off

the final U.S. astronaut to make a prolonged stay aboard the Mir station. It will be the first docking of a shuttle other than *Atlantis* with Mir.

*Endeavour* also is in processing at the Kennedy Space Center for its next flight, slated for mid-January. It is the orbiter's first mission in more than a year since it was taken out of service for its periodic maintenance and upgrade period at its manufacturing plant in Palmdale, Calif.

*Discovery* meanwhile is continuing its post-flight deservicing in the OPF following the STS-94 mission. Its next flight will not be until May 1998 when it will make the final scheduled docking mission to Mir on STS-91.

## Russian station getting ready to receive visitors

By John Lawrence

With the impending rendezvous of *Atlantis* and Space Station Mir, the past several weeks have been a period of intense review and reassessment for managers of the Phase I Program.

Confidence in Mir was crystallized in a news conference statement last week by Phase 1 Program Manager Frank Culbertson, who said Mir is deemed perfectly safe for uninterrupted habitation and continuation of the Phase I Program.

Early in the week, Mir experienced difficulties with its primary Motion Control Computer. The computer shut down Sunday, Sept. 14, and the station went into free drift. Flight controllers in Moscow expressed concern about the power situation in Kvant-2 and instructed the crew to power down the gyroscopes and other non-critical systems in Kvant-2 before sleep.

The Motion Control Computer is composed of three identical channels—two of which must be in agreement at all times. Moscow flight controllers analyzed the two on-board computers and selected the best three channels available in the two systems. The two-computer hookup was tested Monday night and proved functional. A fresh backup Motion Control System computer will be delivered by *Atlantis*.

The station's gyroscopes were reactivated early Wednesday. Six were nominally spun up. By early Friday, 10 gyroscopes were functioning with an eleventh expected to come on-line shortly.

In an audio-only status report early Thursday, Astronaut Mike Foale summarized his space walking experience and scientific research, and reiterated the importance of having an American astronaut on Mir.

"I'd like to summarize really why I think Dave Wolf should stay on board space station Mir when I leave," Foale said. "Really I think it comes down to the fact that even though during this flight, in particu-

lar for me—which has been one of the hardest things I have ever attempted in my life—I have to remember what John F. Kennedy said when I was about four years old. Forgive me if I get it wrong, he said, 'We do not attempt these things because they are easy, but because they are hard, and in that way we achieve greatness.'

"I believe out of this cooperation of America with Russia, which is not always easy, we are achieving some extremely great things, in sum, and in the big picture. And for these reasons I think I've really valued my time onboard space station Mir. I will always remember the last three or four months with great, great alacrity and nostalgia, I'm sure. I really count all that we are doing together, America and Russia, in space and this endeavor to be extremely valuable to future cooperation on Earth."

Astronaut David Wolf, who will replace Foale after *Atlantis* docks with Mir on STS-86, said he feels fully prepared for the mission.

"The training has eased my mind in terms of emergency responses. We're going up with some excellent cosmonaut partners, and I think we'll be able to take care of any emergency that should arise," Wolf said.

"I'm absolutely comfortable with this mission. It's well within my level of comfort, to the point where I just see the task at hand as what I'm worried about—the science, how we're going to effectively use our time as opposed to the danger of this mission," Wolf said.



## Mars Global Surveyor detects magnetic field

(Continued from Page 1)

Center. "This was the first opportunity in the mission to collect close-in magnetic field data. Much more additional data will be collected in upcoming orbits during the aerobraking phase of the mission to further characterize the strength and geometry of the field. The current observations suggest a field with a polarity similar to that of Earth's and opposite that of Jupiter, with a maximum strength not exceeding 1/800ths of the magnetic field at the Earth's surface."

This result is the first conclusive evidence of a magnetic field at Mars. "More distant observations obtained previously by the Russian missions Mars 2, 3 and 5 and Phobos 1 and 2 were inconclusive regarding the presence or absence of a magnetic field of internal origin," Acuna said.

The magnetic field has important implications for the evolution of Mars. Planets like Earth, Jupiter and

Saturn generate their magnetic fields by means of a dynamo made up of moving molten metal at the core. This metal is a very good conductor of electricity, and the rotation of the planet creates electrical currents deep within the planet that give rise to the magnetic field. A molten interior suggests the existence of internal heat sources, which could give rise to volcanoes and a flowing crust responsible for moving continents over geologic time periods.

"A magnetic field shields a planet from fast-moving, electrically charged particles from the Sun which may affect its atmosphere, as well as from cosmic rays, which are an impediment to life," Acuna said. "If Mars had a more active dynamo in its past, as we suspect from the existence of ancient volcanoes there, then it may have had a thicker atmosphere and liquid water."

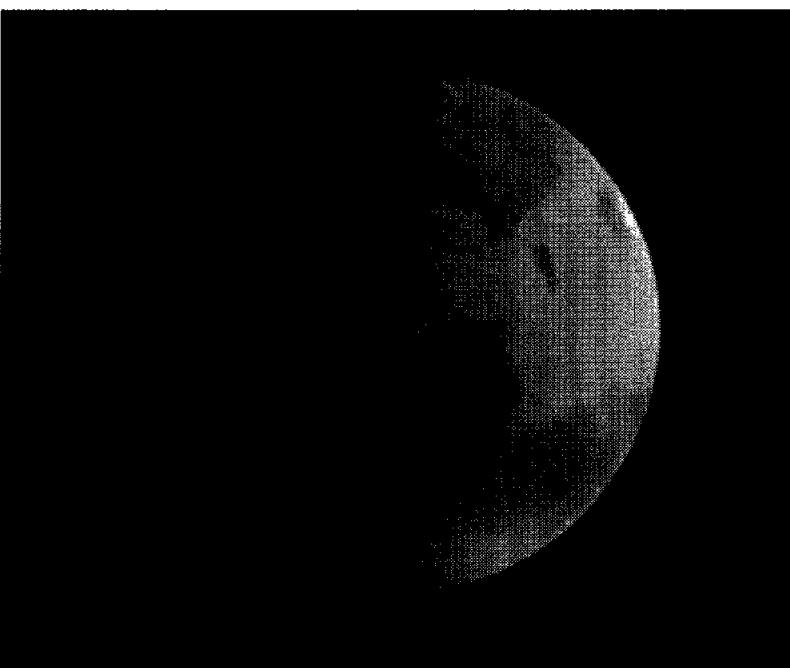
It is not known whether the current weaker field now results from a less

active dynamo, or if the dynamo is now extinct and what scientists are observing is a remnant of an ancient magnetic field.

"Whether this weak magnetic field implies that we are observing a fossil crustal magnetic field associated with a now extinct dynamo or merely a weak but active dynamo similar to that of Earth, Jupiter, Saturn, Uranus and Neptune remains to be seen," Acuna said.

The spacecraft's magnetometer discovered the outermost boundary of the Martian magnetic field—known as the bow shock—during the inbound leg of its second orbit around the planet, and again on the outbound leg.

The discovery came just before Mars Global Surveyor began its first aerobraking maneuver to lower and circularize its orbit around Mars, said Glenn Cunningham, Mars Global Surveyor project manager at NASA's Jet Propulsion Laboratory.



NASA Photo

A new close-up of Mars, taken by the Mars Global Surveyor spacecraft on Aug. 20, shows a prominent dark feature, Syrtis Major, at center, and the large Hellas impact basin is seen at bottom.

## Community News

### Cosmonaut daughter's classmates experience outer space adventure

It's not unusual for Houston area students to have classmates whose mothers or fathers are astronauts.

However, few can say they go to school with the daughter of two Russian cosmonauts. That is the case with the fourth grade at Gary L. Herod Elementary School.

Through the generosity of several businesses, including United Space Alliance, these students were able to add another special experience to their schooling. They traveled to Florida to see the Space Shuttle *Atlantis*' spectacular STS-84 nighttime launch with their classmate's mom aboard.

The crew of the shuttle's sixth mission to the Russian Space Station Mir included cosmonaut Elena Kondakova. During Kondakova's months of training at JSC, her daughter, Gina Ryumina, had been attending fourth grade at Herod Elementary. As usual, plans were made to allow Kondakova's husband, former cosmonaut Valery Ryumin, and Gina to watch the launch with families of other astronauts on the flight.

Ryumin is a veteran of three space flights totaling 362 days in space. Kondakova spent 169 days in orbit aboard Mir between October 1994 and March 1995.

As time neared for the STS-84 lift-off, officials with the Houston Independent School District contacted USA seeking a sponsor for sending two of Herod's fourth grade classes to Florida to witness the launch. The classes are made up of students who are either bilingual or who speak English as a second language. With donations from USA

and other companies, as well as special arrangements from U.S. Space Camp, the way was paved for a unique experience for the

34 youngsters and 13 teachers and parents. Space Camp in Florida is at the gate to the Kennedy Space Center and provides fourth through seventh graders the opportunity to learn about space flight by simulating everything from a shuttle launch to space walking.

"The group from Herod participated in our three-day 'Outer Space Adventure,'" explained Leslie Neihouse, manager of Space Camp-Florida. "We let them try out our simulators, tour the space center and build model rockets."

"All in all, it was a terribly exciting experience for each of us," said Herod Elementary Principal Nancy Nichols. "We are so appreciative of United Space Alliance and the others who made our educational trip possible."



Above: Two of Herod Elementary's fourth grade classes, including 34 students, 13 teachers and parents, experience the STS-84 launch and Space Camp through donations from United Space Alliance and other companies. Left: Gina Ryumina's mother, Elena Kondakova, is welcomed back to Earth by husband and veteran cosmonaut Valery Ryumin moments after *Atlantis* landing May 24. "The shuttle launch was incredible!" said fourth grader Benjamin Heller.

Top photo courtesy United Space Alliance; bottom photo KSC-97PC-849

### Lockheed test program earns excellence award nomination

The Lockheed Martin Science, Engineering, Analysis and Test Program has been nominated by its parent operating company, Lockheed Martin Space Mission Science and Services, to receive the distinguished corporate Environment, Safety and Health Excellence Award.

The SEAT Program, headed by Vice President Ken Reightler, a former NASA astronaut, directly supports JSC by designing, manufacturing, testing, fabricating and installing flight hardware, space shuttle and International Space Station payloads and ground support equipment. SEAT also provides engineering, science, facilities maintenance, test and analysis support to JSC's Engineering and Science Directorates. The 2,300-person organization provides more than 4 million annual work-hours to NASA, approximately 12 percent of the total contractor support to JSC, and functions in a wide

range of potentially hazardous operational environments supporting critical aerospace projects.

The SEAT Program was nominated for the prestigious Lockheed Martin award for dramatically reducing work-related injuries and illnesses over the last three years. During this period, SEAT's Days Away Case Rate, the incidence rate of lost workday injuries per 100 employees, was reduced more than 77 percent, a new low. SEAT experienced only three days-away mishaps in fiscal 1997, a program record. Simultaneously, through an aggressive all-hands program of personal safety awareness, hazard abatement/control and post-mishap injury management, the SEAT Program significantly reduced the overall costs of work-related injuries and illnesses. SEAT is a member of the OSHA Voluntary

Protection Program Participant Association. Policies, procedures and activities are organized to the same attention to detail standards as the SEAT Program's ISO 9001-1994 Certification issued in January 1995. VPP Performance Evaluation Profiles conducted in 1996 indicated a high level of management

and employee confidence and participation. SEAT, as NASA-JSC, follows a

DuPont/VPP 19-element model for management commitment, all hands participation, training, safety awareness, hazard abatement/control and surveillance/inspection.

SEAT performance has been recognized by NASA as a major strength in Contract Performance Evaluations and an irrefutably positive factor in award fee determinations. In 1996, SEAT was asked to become the first NASA-JSC contractor to lead the JSC's

Directorate-level Executive Safety Committee Contractor Affairs Subcommittee and Contractor Safety Forum, two contractor organizations that coordinate many contractor ESH issues for NASA. More than 45 SEAT Program individuals and teams have been recognized for safety and health excellence through the Lockheed Martin's Safety Award For Excellence. SEAT also has 14 of 18 line departments that have logged a minimum of one year mishap-free and averages over 200 NASA Group and Individual Achievement Awards annually.

SEAT also was recently selected to receive the Bay Area Heart of the Community Award for distinguishing itself as a leader in contributing to the business development, health, safety and welfare of the community. In addition, Reightler recently received the American Institute of Aeronautics and Astronautics Technical Administrator Award.

LOCKHEED MARTIN

### Logistics Support Facility marks safety milestone

Employees at the United Space Alliance-managed Logistics Support Facility, in Houston, have achieved their goal of 1 million hours worked without a lost-time injury. Several executives, including members of USA and NASA management, congratulated employees for reaching this important safety milestone.

"All the employees at the LSF have gone the extra mile to make the workplace environment safe," said Jim Broadfoot, acting director of USA Flight Operations Logistics.

"I'd like to congratulate you on reaching the one-million-hour mark," said Brian Duffy, acting JSC deputy director. "You treat safety as a way of life in doing your jobs."

Teamwork by LSF-USA management, the LSF safety committee, the USA safety team and the entire LSF work force, including all subcontractor members, led to the achievement in March. The LSF safety committee works closely with employees to ensure their concerns are addressed and that potential risks are resolved before any accident occurs.

The LSF team reached the 500,000-hour milestone back in March 1995. This enabled the facility to apply for admission into OSHA's Voluntary Protection Program. OSHA was to conduct an audit to determine its application for membership in the VPP. The LSF would be the first NASA contractor and USA facility to attain VPP status.

The VPP is a program established by OSHA for companies whose cooperative effort between labor and management has resulted in excellent safety and health programs.

USA and Boeing North American employees at the NASA Shuttle Logistics Depot also are working to achieve world-class status through the VPP. The NSLD VPP team will complete an application by the end of November 1997.

Highly automated through the implementation of radio frequency bar code scanning technology, the LSF is the warehouse for all equipment and inventory for the USA Space Flight Operations Contract team.

JSC Safety Alert

### Evacuating Facilities in Emergency Situations

#### What Happened

Recent incidents have occurred at JSC where facility evacuations have been delayed in emergency situations due to some confusion in evacuation procedures. For example, while operating a forklift in a JSC facility the elevated mast of the forklift accidentally struck a gas pipe near the ceiling, causing it to break at a connection. Pressurized natural gas began discharging into the building, creating a hazardous condition that could have resulted in a fire or explosion. After the accident the forklift operator notified his supervisor of the accident, and the supervisor notified the facility manager. The facility manager notified "Facility Maintenance and Repairs," then "Utilities Interruptions or Failures." Then the JSC emergency telephone number was called. Eventually, verbal notification was given to evacuate the facility. Considering this was a natural gas leak, the verbal evacuation was an acceptable method. However, valuable time was lost in making the phone calls prior to initiating the evacuation, and the hazard was increased.

#### What You Can Do

If an event occurs in your facility that you believe creates an imminent hazard condition, evaluate the situation, and take immediate action to reduce the hazard risk to the occupants. In the event of visible fire or smoke, pull the nearest fire alarm. This action will initiate an immediate Fire Department response and ring the fire alarm bells in the facility causing an evacuation. For an uncontrollable water discharge, such as from a broken water pipe, which could result in an electrocution hazard, pull the nearest fire alarm. If a strong odor of gas is detected in the building initiate a verbally communicated evacuation and call the emergency number from another location. If a strong gas odor is detected outside the building, call the emergency number, but do not evacuate the building. Facility Managers should review their Facility Emergency Action Plans and ensure all facility occupants are familiar with them. The JSC Emergency telephone number is x33333 (at Ellington Field x47231).

# Flexible Flight

## Changes to STS-86 mission providing new insight into what life will be like in space station era

Flexibility has been a word for the STS-86 astronauts to live by, as everything from the roster of crew members to the launch date has changed to accommodate the dynamic situation aboard the Mir Space Station.

But the crew reports it is weathering the changes well and is well prepared for the rendezvous and docking, as well as a joint space walk, even though the objectives of those activities have changed from routine to repair.

"Well it is getting more exciting," said Commander Jim Wetherbee, who will be making his fourth shuttle flight. "We changed vehicles a couple of times. We've changed the launch dates. We were going to go later, going to go earlier. And so we got used to the flight being flexible—but I didn't really expect that it would change this much close to flight. This is part of the allure that we have for this business, being able to handle changes."

Among the recent changes were the addition of Astronaut Dave Wolf to the crew, who will be taking Wendy Lawrence's place as a member of the Mir 24 crew because a Russian Orlan space suit will fit him and allow him to participate in external space walks.

"I myself made the call that 'I don't fit your EVA suit,'" said Lawrence, who will be flying as a mission specialist and returning to Earth with the rest of the STS-86 crew. "In light of the recent events on board Mir, the collision of Progress with Spektr, and the Russians' desire to fix the Spektr module, there will be a significant number of EVAs in the future. I personally think that's a very wise decision operationally."

Lawrence has no regrets and would go back to Russia and do it all again. The name of the game is the International Space Station, she said, and that means a great deal of further work with the Russians. And she said she believes she still has an important role to fill on the mission.

"Talking with Dave Wolf about that, it became clear to me that Dave was really going to need some help on orbit getting set up," Lawrence said. "He's not as familiar with the NASA-6 Science Program as I am, although he's had training on all the experiments. And I decided that the best contribution that I could make to the STS-86 mission and to the NASA-6 Mission would be to get up on-orbit, get into the Priroda module, and unpack all the hardware that Dave will be using during the duration of his mission, and basically get him setup for his first month."

Wetherbee said Lawrence's attitude is indicative of the type of camaraderie, flexibility and dedication that will be needed by all of the countries who are banding together to build the International Space Station.

"As little as two months ago, we were pretty ignorant of the types of things that could happen on a space station. There were probably some forward thinking folks around here who knew that you can have problems on a space station," he said. "But two months ago, I'll bet not many of us thought that you could have this many problems in a short period of time. We need to really prepare for these kinds of things as we continue to design the International Space Station."

"Sure you could stop right now. We could even not fly to Mir and you could stop that program, and then you will never learn the lessons that we are going to learn in the next three months," Wetherbee said. "And years from now, generations who have succeeded us will laugh at us because we stopped. The things that we learn in the next several years are going to help humanity."

This is the seventh of nine planned missions to Mir and the fourth one involving an exchange of U.S. astronauts. Mike Foale, who has been on Mir since mid-May, will be replaced by Wolf, who will spend more than four months on Mir. He will return to Earth on STS-89, scheduled for launch in January.

"We're learning how to deal with real crisis situations," agreed Mission Specialist Scott Parazynski. "Jerry Linenger's experience with the fire on board the Mir Space Station, Mike Foale's experience with the cabin de-pressurization, and then of course all the engineers and technical people here on the ground learning how to work together to solve these very difficult problems. I think the lessons are

coming in fast and furious right now, and in fact the return on our investment has never been greater than it is now in the Phase 1 program," he said.

Flying with the Americans on *Atlantis* are Russian Vladimir Titov and Frenchman Jean-Loup Chrétien, both of whom are returning to a space station they've already visited.

"I am happy to be in this crew, and I will be happy, after nine years, to be on Mir station again," said Titov, who will use his knowledge of Mir to coordinate the supply and equipment transfers from the shuttle and its pressurized double Spacehab module. "That's very interesting for me, to inspect station and to check what was before and what is right now."

"I think this new opportunity to share activities with other people, with Russians in that case, with what happened on Mir, it's for us extremely positive for the future, before the space station achievement," Chrétien said. "We learn a lot right now. And it's better to do that now on an old space station, than to have to do it and learn on the new one."

*Atlantis'* rendezvous and docking with the Mir were to have begun with Thursday's precisely timed launch. Over the next several days, periodic firings of *Atlantis'* thrusters will gradually bring the shuttle closer to Mir.

"What'll be different with our flight is that Mir has been damaged and so the question to be asked is, 'How long can Mir maintain a stable attitude where we can dock?'" said Pilot Mike Bloomfield, who is making his first space flight.

"Previous flights have docked approaching from the Earth up towards Mir, and this is called an R-bar approach. And there's a natural braking effect that is felt by the orbiter as it approaches Mir, which allows the orbiter to slow down as it gets ready to dock with Mir. In order to do that, Mir has to come out of an attitude that it normally likes to be in. Mir likes to be in an attitude where its solar arrays are pointed at the Sun, so that it can get energy and it can maintain life on Mir. Well, with the recent damage, they don't have that much electricity. So the amount of time that they can spend in this attitude where we can dock, where their solar arrays aren't pointed at the Sun, may be minimized. As a crew, we've been practicing to do different types of docking, based on what the situation will be once we get up there with Mir," he explained.

In addition to working with transfer activities, Titov will conduct a space walk with Parazynski. The pair will spend five hours retrieving four Mir Environmental Effects Payloads from the exterior of Mir's docking module. The experiments, attached in March 1996, are studying the effects of exposure on a variety of materials.

"This is a very exciting space walk that we'll be conducting. It's the first ever joint shuttle-based space walk between the two countries," Parazynski said. "Vladimir is a seasoned Russian space walker. This'll be my first space walk, but I have trained for space walk activities before."

Parazynski and Titov also will leave on the exterior of Mir a solar array cap to be placed on the damaged Spektr module on a later Russian space walk. It will be brought out of the shuttle airlock and tethered to the exterior of the docking module. The cap, too large to be transferred through Mir, is needed to seal off the base of the damaged array on Spektr if the array is jettisoned.

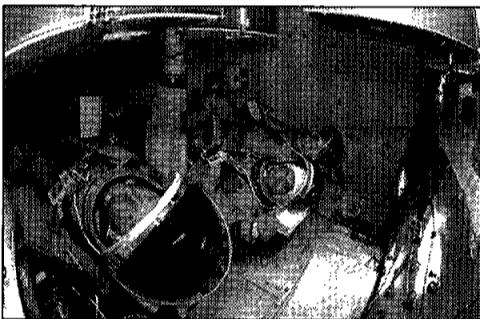
When *Atlantis* undocks from Mir, the separation maneuvers performed will have two objectives. First, it will "station-keep" to collect data for the European laser docking sensor. Then, *Atlantis* will re-approach to a distance of 240 feet and begin a fly-around to document the damage from the Progress collision.

Wetherbee said he has an even broader goal for STS-86 and the Phase 1 program.

"If we learn nothing else, I hope that we learn from the Russians that we need to have that kind of perseverance in our space program," he said. "They'll march on in the face of tremendous adversity and complete the task and complete the mission. So, this is the perfect kind of partner that I want to have as we continue to leave the planet and look out farther away from just our local environment on to the Moon and on to Mars."



KSC-97EC-1359



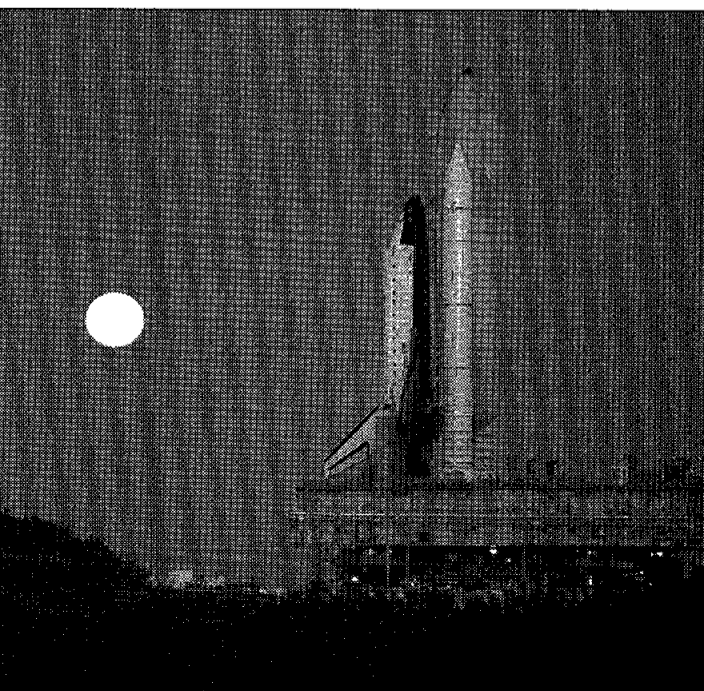
KSC-97EC-1374



KSC-97EC-1352



KSC-97EC-1370



Top to bottom, left to right: 1) The STS-86 crew participates in a launch dress rehearsal. Standing, from left are Mike Bloomfield, Scott Parazynski, Jim Wetherbee, Jean-Loup Chrétien. Seated, from left are Vladimir Titov, Dave Wolf and Wendy Lawrence; 2) Chrétien, Wolf and Lawrence practice the launch on *Atlantis'* middeck; 3) Parazynski, Lawrence and Titov check out an armored launch pad escape vehicle; 4) Chrétien and Wetherbee test the escape basket system; and 5) *Atlantis* makes its way to the launch pad.

KSC97EC-1249



S97-11022



S97-11026



S97-11028

# Wolf prepares for visit to future

## Next long-duration Mir crew member ready after accelerated training

A year ago last month, Dave Wolf went to Russia to prepare for a rather lengthy business trip—to space. That trip originally was on the books for January 1998 and his schedule was planned accordingly. But some of the job requirements changed, dictating that the beginning of the trip will start a little sooner—this week.

By Kyle Herring

Atlantis is set to make its seventh, and final, visit to Mir—the sixth as a crew transfer vehicle—to continue the permanent U.S. presence on the station. That contium began a year and a half ago with shuttle/Mir mission three, STS-76, that delivered Shannon Lucid to the orbiting outpost. Astronaut David Wolf likens his voyage as a look into the future.

When Lucid's flight was lengthened unexpectedly by about six weeks, Wolf was just about to be named as the last astronaut to stay on Mir to complete the first step-or Phase I—toward building of the new International Space Station.

But due to a joint decision by NASA and the Russian Space Agency following the accidental collision of a Progress resupply craft with Mir's Spektr module, making it preferable for the astronaut on board to be qualified to join cosmonauts in space walk activity, Wolf's role as backup to Wendy Lawrence changed, putting him next up for a long-duration stay in space.

He now may be called upon to help ascertain the actual damage and possible fixes that could restore the module to use in some capacity. Lawrence will fly aboard Atlantis as a logistics transfer coordinator and assist Wolf with his transition to life in space as Mike Foale's replacement.

When notified of the switch, Wolf's first concern was Lawrence. "Immediately it went through my mind how Wendy would feel about it and she understood that the requirements of the mission had changed."

Since Wolf has trained almost exclusively as Lawrence's backup since their arrival in August 1996, he feels not only capable of

doing the job earlier than planned, but qualified too, with her assistance.

"She is a very critical part of this mission," Wolf says. "She's the most knowledgeable on the experiment transfers and installation in the Mir. I wouldn't want to do this without her getting me off to a good start. She did the hard parts of the planning for this mission, and I'm getting the benefit of her excellent planning."

Though he didn't want to go to Russia at first, Wolf says now it has "turned out to be one of the best experiences of my life. They are great people. They're gentle people."

"The close and trusting relationship between instructors and controllers (in Russia) is as important as it is in the American space program," he says. "So overall, it has been just a great experience and we can look forward to a real interesting and mutually beneficial program cooperatively with the Russians."

Wolf came to NASA in 1983 to help with the development of a system to study the effects of microgravity on the human body's cardiovascular system. As a physician, he is most interested in space medicine, but has trained for all types of operations in space.

Prior to coming to work at JSC, Wolf worked in his hometown of Indianapolis at the Center for Advanced Research while attending medical school at Indiana University. He joined NASA after completing his medical internship at Methodist Hospital in Indianapolis, where his parents still live.

Because of that background, the new requirement that compressed his training schedule for the last few months at the Gagarin Cosmonaut Training Center in Star City on the outskirts of Moscow—though intense—did not disrupt his mission preparations. Nor were activities shortened or overlooked. He describes the last three months of training as "very busy," but "done effectively."

The new requirement to be prepared to conduct space walks meant Wolf would focus on becoming extravehicular activity

qualified in a short period of time.

"It meant getting in a space suit half of every day" to complete a training program that normally would be stretched across a two to four month period, Wolf says. "I enjoyed this kind of immersion training. I got up and knew I was doing EVA and kept my mind set for that," he adds.

Though space walk capability was the reason Wolf's stay on Mir has been moved up—Lawrence is too small to fit in the protective space suit used for Russian EVAs—Wolf prefers to concentrate on the continuing science investigations that can only be done in space. It is his first love and the one he has spent most of his professional career investigating.

Despite the whirlwind training, Wolf says he feels fully prepared for any tasks that await, from taking part in space walks to further inspect Spektr's damage, to conducting a full slate of science investigations for which he has trained.

"We have great science going" on this mission, Wolf says. "We're doing physiology research...valuable to any osteoporotic condition on the Earth. We have a full array of materials processing, alloy production, crystal growth, Earth observations, resource management and pollution studies."

While some of the experiments that have been conducted thus far in the shuttle/Mir program will be brought back with Foale in early October at the conclusion of the flight, new innovative investigations will begin with Wolf and his as yet unnamed replacement.

"We're taking up two instruments that are the beginnings of our tissue engineering program to investigate tissue culture for cancer research and for growing replacement tissues," Wolf says. "Space offers us the ability to grow three-dimensional cancer tumors in a way they cannot be grown on Earth."

This means that these tissues can be grown to almost exactly model the growth of tumors or tissues as they would inside the

body. Wolf describes this as a new opportunity to look at the genetics and treatments that will serve as "an excellent model for the ISS, which is really an international laboratory with microgravity being the unique resource."

The problems that have been encountered aboard Mir during the last eight months have not deterred Wolf. "The risks of this type of mission are well within acceptable limits," he says, but quickly adds that it's a bit more difficult to convince family and friends that don't follow the day to day operations in space.

"We are well trained to respond as a crew to problems as was admirably demonstrated by Jerry (Linenger) and Mike," he says, but "I try to let them know that we have carefully planned for contingency actions covering the events which are reasonably likely."

Wolf was selected to be an astronaut in 1990 and flew on a life sciences mission to study, coincidentally, the effects of space on the human body. Two of his crewmates on that mission were Shannon Lucid and John Blaha, who have since preceded Wolf on Mir.

For the remainder of Phase I and beyond, Wolf says a myriad of lessons learned from previous astronauts will be used to prepare for even longer stays in space. Astronauts are right now learning extensively from the experiences gained from Dr. Norm Thagard, Lucid, Blaha, Linenger and now Foale. "We are certainly riding on their shoulders," Wolf says.

Adversity is a true test of the effectiveness and value of continuing Phase I and other partnerships in space, including the International Space Station, Wolf says.

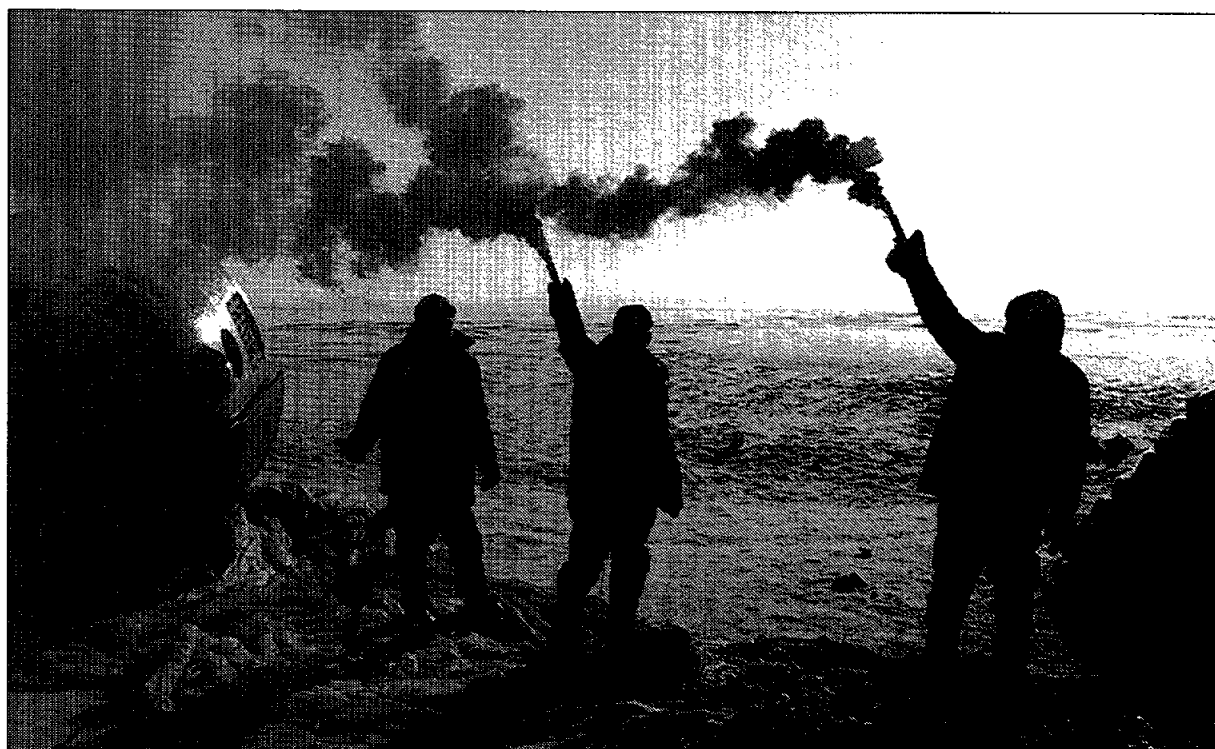
"Fundamentally, it is easy to be good partners when everything is going smoothly," he says. "It's now when things aren't quite so smooth that we can show just how good a partner we can be with the Russians."

Wolf says the experiences seen in the shuttle/Mir program are a look into the future of space operations. "It's a crystal ball that we're looking at and getting an excellent view of our International Space Station eight, 10 years down the road."



S97-11027

Clockwise from top left: 1) Astronauts Dave Wolf, left, Wendy Lawrence, center, and Cosmonaut Sergey V. Zaletin, right, participate in Soyuz training activities. 2) Wolf undergoes Arctic survival training in Siberia. 3) Wolf and Lawrence give a thumbs-up after a water survival training exercise. 4) Wolf and Lawrence await rescue in their Soyuz water survival gear. 5) Wolf and Lawrence light flares to attract rescuers to a simulated emergency landing site.



S97-11030

# 35 Years Ago at MSC

## Kennedy makes MSC third stop in 'space tour'

Reprinted from the Sept. 19, 1962 issue of Space News Roundup.

"We talk about doing this in five or six years," President John F. Kennedy said last Wednesday of this country's planned landing on the moon. "This indicates how far and how fast we have come, and how far and how fast we must go."

The President had just accepted a small desk model of the Apollo command module from MSC Director Robert R. Gilruth. The presentation concluded an hour-long classified briefing by Dr. Gilruth and his staff and a fast tour of a dozen exhibits set up for him in the Rich Building. They included two mock-ups of the Apollo command module, one of which he entered, escorted by Astronaut Donald K. Slayton; Astronaut M. Scott Carpenter's "Aurora 7" spacecraft, which Carpenter briefed him on; a display of survival equipment demonstrated by Astronaut John Glenn Jr.; a vibration table; a mock-up of the Gemini spacecraft explained by Astronaut Virgil I. Grissom; a model of the Rogallo wing; and the first showing of a preliminary mock-up and design proposal of the lunar excursion module, explained by Astronaut Alan B. Shepard Jr.

President Kennedy arrived in Houston Tuesday night, Sept. 11, on the third stop in his two-day whirlwind tour of the nation's space facilities. During the day Tuesday he visited Marshall Space Flight Center in Huntsville, Ala., and Cape Canaveral, Fla. From Houston he continued to St. Louis, Mo., and the McDonnell Aircraft Corp. plant, and was back in Washington Wednesday night.

Wednesday morning, he told a crowd of 45,000 gathered in Rice Stadium:

"The exploration of space will go ahead, whether we join it or not... no

nation which expects to be a leader of other nations can expect to stay behind in this race for space.

"In the last 24 hours we have seen the facilities now being created for the greatest and most complex exploration in man's history."

Of Houston, he said, "What was once the farthest outpost in the old frontier of the West will be the farthest outpost on the new frontier of science and space. During the next five years, NASA expects to double the number of scientists and engineers in this area, to increase outlays for salaries and expenses to \$60 million a year; to invest some \$200 million in plant and laboratory facilities; and to direct or contract for new space efforts over \$1 billion from this Center.

"This year's space budget is three times what it was in January 1961, and it is greater than the space budget of the previous eight years combined. That budget now stands at five billion four hundred million dollars a year—a staggering sum, though somewhat less than we pay for cigars and cigarettes every year.... (But) I think we must pay what needs to be paid. I don't think we ought to waste money but I do think we ought to do the job. And this will be done in the decade of the '60s."

President Kennedy was greeted by a crowd of 25,000 at Houston Intercontinental Airport Tuesday night and presented with a key to the city by Houston Mayor Lewis Cutrer as part of the welcoming ceremony. He spent the night at the Rice Hotel. An estimated 172,000 persons lined the route to the hotel, where 3,000 more were congregated.

Accompanying the President to Houston were Vice President Lyndon B. Johnson; Rep. Albert Thomas of Harris County, head of



Above: Starting into the briefing room at MSC, President John F. Kennedy is flanked by MSC Director Gilruth (left) and Vice President Lyndon Johnson. The classified briefing lasted over an hour. Left: Astronaut John H. Glenn Jr., gives the President a quick run-down on the display of survival gear as the chief executive took a quick tour of a dozen displays set up for him after the classified briefing.

JSC Photos S62-3985 and S62-3987

the House Appropriations Committee; Rep. George Miller (D-Calif.) chairman of the House Science and Astronautic's Committee; and James E. Webb, NASA Administrator.

Crowds also lined the route from the Rice Hotel to Rice University Stadium Wednesday morning and from the stadium to the Rice Building. Opposite the side

entrance to the Rich Building some 700 grade school children from J.P. Cornelius school cheered the President's arrival.

At Cape Canaveral Tuesday, President Kennedy told a cheering crowd gathered around Hangar S that "we shall be first" in space. He saw the Mercury-Atlas which will take Astronaut Walter M. Schirra into space and was met upon his

arrival by Schirra himself, who explained the project. He looked at two Titan II boosters, and talked briefly at public and classified briefings on this and other space programs. He visited Complex 37, launch site for Saturn C-1 boosters and talked briefly at Hangar S with Astronaut L. Gordon Cooper before visiting the high altitude chamber there.

## 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 first come, first served. 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.

**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 required. Cost is \$25. Call for next available class.

**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. Next class is Oct. 9 and 23. 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. Cost is \$35 per month. New classes begin the first of each month.

**Step/Bench aerobics:** Classes meet from 5:15-6:15 p.m. Monday, Tuesdays and Thursdays. Cost is \$32 for eight weeks. Kristen Maidlow, instructor.

**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 (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

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 and in the Bldg. 3 Exchange Store from 7 a.m.-4 p.m. Monday - Friday. For more information call x35350 or x30990.

**Galveston Storm vs. Chorpus Christ Sharks,** Southwest Basketball League, 7 p.m. Nov. 7, Moody Gardens Convention Center, regular seating \$20, VIP seating \$40, on sale through Nov. 1.

**EAA Wurstfest Bus Trip:** Nov. 8, \$20, on sale through Oct. 31.

**EAA Texas Renaissance Festival Bus Trip:** Oct. 25 and Nov. 15, adults \$17.50; children (5-11) \$11; under 5 (but need bus seat) \$5; on sale through Nov. 14.

**EAA Grand Casino Coughatta Bus Trip:** Oct. 26, \$5, no sale through Oct. 17.

**Astroworld:** \$22.75. Two-day \$37.50.

**Astroworld:** \$19 Blue Light Special, valid only in Houston, through 1-4-98.

**Moody Gardens:** Tickets are \$9.50 for 2 of 4 events.

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

**Space Center Houston:** Adult \$8.95; children (4-11) \$6.40 JSC civil service employees free.

**Waterworld:** \$11.50.

**Movie discounts:** General Cinema, \$5.25; AMC Theater, \$4.50; Sony Loew's Theater, \$4.75.

**Shirts:** JSC logo T-shirt, \$10, polo style, \$23; International Space Station logo golf shirts, \$26 and \$28.

**Stamps:** Book of 20, \$6.40.

**Metro tickets available.**

**Upcoming events:** EAA Spring Break Ireland Trip: March 21-29, \$1,399 per person, double occupancy (\$200 deposit per person, final payment due Jan. 21).

## People on the Move

Human Resources reports the following personnel changes as of September 13

### New Management Assignments

Stan Schaefer has been selected as a branch chief in the Systems Division in the Mission Operations Directorate.

### Additions to the Workforce

Elizabeth Bloomer joins the Cargo Integration and Operations Branch in the Mission Operations Directorate as a payload operations engineer.

Suellen Sandlin joins the Cargo Integration and Operations Branch in the Mission Operations Directorate as a secretary.

John Gatto joins the Communication and Data Systems Branch in the Mission Operations Directorate as a flight controller.

Jeffrey George joins the Advanced Development Office of the Engineering Directorate as a systems engineer.

Francis Cucinotta joins the Space Science Branch of the Space and Life Sciences Directorate as a radiation scientist.

Philip Mortillaro joins the Program Integration Office of the Space and Life Sciences Directorate as an aerospace engineer.

Charlotte Shannon joins the EVA Project Office as a secretary.

### Promotions

Earlene Green was selected as a program assistant in the Business Management Directorate.

### Resassignments Between Directorates

David Lee moves from the Space Shuttle Program Office to the Engineering Directorate.

Charlotte O'Neil moves from the Business Management Directorate to the Safety, Reliability, and Quality Assurance Office.

Mark Hershey moves from the Business Management Directorate to the International Space Station Program Office.

### Retirements

John Hyams of the Engineering Directorate.

Sam Kamen of the Space Shuttle Program Office.

### Resignations

John Masetta of the Information Systems Directorate.

Gaylen Johnson of the Space and Life Science Directorate.

## Speed limits—computer, that is—increase at JSC

Increased modem speeds (not automobile speeds) are now available to computer users dialing in to JSC computer systems.

Bob Neil of the Information Systems Directorate reports the upgrade of remote dial-in modems used by both the Shiva LanRovers and Cubix remote control servers from 14.4 kilobits per second to 33.6 Kbps.

"The upgrades performed by the Information Systems Contract were completed by September 19," Neil said. "Most dial-in users will see an improvement from 14.4 to about 24-28 Kbps depending on their telephone line quality and other factors.

No configuration changes were necessary for Shiva or Cubix users."

"You won't have to learn any new telephone numbers," Neil remarked. Both the primary telephone number for the Shivas, 281-280-4800, and the Shiva toll-free number, 800-465-8538, will point to the upgraded modems. Shiva users should note that the old 28.8 Kbps number, 281-483-2801, will be deleted. Cubix dial-in numbers 281-483-2602 and 1-800-483-2602 have not been changed.

Dial-in users with questions regarding these upgrades, should call the Information Technology Operations Center at 483-4800.

# USA realigns key executive team

Lunney heads strategic planning; DeCastro flight operations

Glynn Lunney and Howard DeCastro have been appointed to key executive positions under a management alignment announced by United Space Alliance President and Chief Executive Officer Paul B. Smith.

Lunney, who has served as USA vice president and program manager since the joint venture was formed in 1995, has been named to the new executive position of vice president, strategic and business planning.

DeCastro, who has served as deputy program manager since joining USA in 1996, becomes vice president and program manager.

Smith said the appointments

were made as "part of our efforts to align the USA management structure to best achieve the company's vision and strategic business objectives."

As program manager, DeCastro is responsible for the performance and continual improvement of business that is part of USA's Space Flight Operations Contract with NASA.

Lunney's new responsibilities include directing efforts on Phase II of the SFOC—the acquisition of additional shuttle hardware contracts, and Phase III contract privatization, as well as positioning USA for potential new business opportunities.

The SFOC was signed by NASA and USA on Sept. 26, 1996, to conduct space shuttle ground and flight operations and training for NASA, and to gradually assume management oversight of the Space Shuttle Program.

Lunney has a distinguished career in the aerospace business that goes back to the beginning of NASA's manned space programs in the 1950s. After a 30-year tenure with NASA, he became president of Rockwell Space Operations in Houston before joining USA.

Prior to joining USA, DeCastro was chief executive officer of NATCO, a Northwest Airlines training subsidiary.

## JSC clinic offers flu vaccinations

With Autumn here, along with cooler weather, the JSC Clinic reminds all employees that flu season also is coming. The clinic will offer influenza vaccinations for all NASA badged civil service and on-site contractor personnel.

Vaccinations will be offered beginning the week of Sept. 29, and every other week after that, from 10 a.m.-noon and 1:30-3 p.m. The clinic is in Bldg. 8.

"We are offering the shots every other week because this is also the time for astronaut candidate exams, which begin Oct. 5," staff nurse Ramona White said.

Flu shots are recommended for people over 65, anyone with chronic cardiovascular or pulmonary illnesses and anyone else at high risk for contracting the disease. Exceptions are individuals who are pregnant, have fever or egg hypersensitivity.

The flu shot is a killed influenza virus, resulting in fewer side effects. It takes about three weeks to take effect. According to the U.S. Public Health Service, the major flu strains for 1997-1998 are A/Johannesburg, A/Nanchang and B/Harbin. This is the basis for this season's influenza vaccination.

Influenza viruses can cause major respiratory illness, including several types of pneumonia. The flu is characterized by sudden onset of fever, sore throat, unproductive dry cough and general malaise. For additional information, call the JSC Clinic at x34111.



WSTF Photo 0897-2278 by Lou Rosales

**EXCHANGE SCHOLARSHIP**—The 1997 JSC Exchange Scholarship is presented to Selina Marie Marquez, shown here (center) with her mother, Rosemarie Marquez of the NASA Quality Assurance Office at White Sands Test Facility, and WSTF Manager Grady McCright. The four-year, \$1,000-a-year scholarship was available to children of NASA employees throughout JSC at both Houston and WSTF. Selina recently graduated with honors from Las Cruces High School, where she also was active in extracurricular activities. She is now attending New Mexico State University, majoring in chemistry, and working toward a degree in pharmacy.

## MCC open for viewing

The Mission Control Center viewing room will be open for JSC and contractor badged employees and their families during portions of the STS-86 mission.

Employees will be allowed to visit the MCC from 5-7 p.m. Friday, Sept. 26; noon-2 p.m. Saturday, Sept. 27; 3-5 p.m. Sunday, Sept. 28; 3:30-5:30 p.m. Monday, Sept. 29; noon-2 p.m. Tuesday, Sept. 30; 10 a.m.-noon Wednesday, Oct. 1; 12:30 p.m.-2:30 p.m. Thursday, Oct. 2; 2-4 p.m. Friday, Oct. 3; 2-4 p.m. Saturday, Oct. 4; and 1-3 p.m.

Sunday, Oct. 5.

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

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

## Dates & Data

### Oct. 1

**Astronomy seminar:** The JSC Astronomy Seminar will meet at noon Oct. 1 in Bldg. 31, Rm. 129. For more information, call Al Jackson at x35037.

**Spaceland Toastmasters meet:** The Spaceland Toastmasters will meet at 7 a.m. Oct. 1 at the House of Prayer Lutheran Church. For more information, call Jeannette Darcy at x45752.

**Spaceteam Toastmasters meet:** The Spaceteam Toastmasters will meet at 11:30 a.m. Oct. 1 at United Space Alliance, 600 Gemini. For details, call Patricia Blackwell at 281-282-4302 or Brian Collins at x35190.

### Oct. 2

**Warning system test:** The site-wide Employee Warning System will undergo its monthly audio test at noon Oct. 2. For more information call Bob Gaffney at x34249.

### Oct. 7

**ASQ meets:** The Bay Area

Section of the American Society for Quality will meet at 6 p.m. Oct. 7 at the Ramada King's Inn on NASA Road 1. The discussion will focus on an "Electronic ISO9000 Tracking System." Dinner costs \$9. For more information, call Ray Swindle at 281-335-6948.

### Oct. 8

**MAES meets:** The Society of Mexican American Engineers and Scientists will meet at 5 p.m. Oct. 8 at Mario's in Webster. For details, call G.D. Valle at x38835.

**PSI meets:** The Clear Lake/NASA Chapter of Professional Secretaries International will meet at 5:30 p.m. Oct. 8 at the Holiday Inn, NASA Road 1. Dinner costs \$15. For details, call Elaine Kemp at x30556.

**Spaceland Toastmasters meet:** The Spaceland Toastmasters will meet at 7 a.m. Oct. 8 at the House of Prayer Lutheran Church. For more information, call Jeannette Darcy at x45752.

**Spaceteam Toastmasters meet:**

The Spaceteam Toastmasters will meet at 11:30 a.m. Oct. 8 at United Space Alliance, 600 Gemini. For details, call Patricia Blackwell at 281-282-4302 or Brian Collins at x35190.

**NMA seminar:** The National Management Association's Texas Gulf Coast Council will present "Financial Strategies for Successful Retirement," a three-part seminar, from 6-9 p.m., Oct. 8, 15, and 22, in the USA Bldg., 1150 Gemini, in the first floor auditorium. Cost is \$60 for members, \$85 for non-members. For more information call Richard Hergert at 281-280-0444.

**Astronomy seminar:** The JSC Astronomy Seminar will meet at noon Oct. 8 in Bldg. 31, Rm. 129. For more information, call Al Jackson at x35037.

### Oct. 10

**Astronomical Society meets:** The JSC Astronomical Society will meet at 7:30 p.m. Oct. 10 at the Lunar and Planetary Institute, 3600 Bay Area Blvd. For more informa-

tion, call Chuck Shaw at x35416.

### Oct. 14

**NPMA meets:** The National Property Management Association will meet at 5 p.m. Oct. 14 at Robinette and Doyle Caterers, 216 Kirby in Seabrook. Dinner costs \$14. For additional information call Sina Hawsey at x36582.

**Aero club meets:** The Bay Area Aero Club will meet at 7 p.m. Oct. 14 at the Houston Gulf Airport clubhouse at 2750 FM 1266 in League City. For additional information call Larry Hendrickson at x32050.

### Oct. 15

**Safety day:** JSC Safety and Total Health Day will be Oct. 15. All JSC organizations will stand down for discussions and presentations about safety and employee health and well-being.

**Astronomy seminar:** The JSC Astronomy Seminar will meet at noon Oct. 15 in Bldg. 31, Rm. 129. For additional information, call Al Jackson at x35037.

**Scuba club meets:** The Lunar-fins will meet at 7:30 p.m. Oct. 15 at the Redfish Restaurant under the Kemah/Seabrook bridge, Seabrook side. For additional information, call Fred Toole at x33201.

### Oct. 16

**Directors meet:** The Space Family Education board of directors will meet at 11:30 a.m. Oct. 16 in Bldg. 45, Rm. 712D. For additional information on this open meeting, call Gretchen Thomas at x37664.

### Oct. 22

**Astronomy seminar:** The JSC Astronomy Seminar will meet at noon Oct. 22 in Bldg. 31, Rm. 129. For additional information, call Al Jackson at x35037.

### Oct. 23

**Radio club meets:** The JSC Amateur Radio Club will meet at 6:30 p.m. Oct. 23 at Piccadilly Cafeteria, 2465 Bay Area Blvd. For additional information, call Larry Dietrich at x39198.

## NASA Briefs

### Cassini spacecraft launch reset to Oct. 13

The launch of NASA's Cassini spacecraft aboard a U.S. Air Force Titan IVB rocket has officially been rescheduled for Monday, Oct. 13. The payload is now back at Complex 40 atop the Titan IV Centaur. The launch window for Cassini extends from 3:55 to 6:15 a.m. CDT.

Cassini is a joint NASA-European Space Agency mission to Saturn, which is scheduled to arrive at the ringed planet in 2004 after more than six years of interplanetary travel. After arrival, the spacecraft will orbit Saturn for four years studying the gas giant planet, its rings and moons, and the ESA-built Huygens probe will descend to the surface of the giant moon Titan.

### NASA-invented filter may aid pilots, drivers

A new change to a sunglass filter developed by NASA engineers may make skies and roads safer by helping pilots and drivers to see better. The original filter, the passive chlorophyll detector, a low-cost, brownish, plastic material, was developed by Dr. Leonard Haslim at NASA's Ames Research Center to help farmers identify diseased plants. This filter was modified by Optical Sales Corp., Portland, Ore., and used in a new sunglass product now being marketed. Government inventions, like the NASA filter, are often commercialized by industry, according to Michael Weingarten, manager for business development at NASA Headquarters, Washington, D.C. "NASA invests more than \$5 billion in technology development annually," he pointed out. "It makes good economic sense to bring that state-of-the-art technology back to U.S. taxpayers when such a huge investment is being made," he concluded.

### Hubble on trail of gamma-ray fireball

New Hubble Space Telescope observations of the ever-fading fireball from one of the universe's most mysterious phenomena—a gamma ray burst—reinforces the emerging view that these titanic explosions happen far away in other galaxies, and are among the most energetic events in the universe. Recent findings from the Hubble Imaging Spectrograph, reported Sept. 16 at the fourth Huntsville Symposium on Gamma Ray Bursts, show that over the past six months, the fireball is fading at a constant rate. This fact means the explosion must have happened at the vast distances of galaxies.

# Crippled Lewis spacecraft to reenter

NASA's Earth-orbiting Lewis spacecraft is expected to reenter Earth's atmosphere after unsuccessful attempts to re-establish radio contact.

Lewis entered a slow spin on Aug. 26, and due to increasing atmospheric drag, the spacecraft's orbit is deteriorating. It is expected to reenter and burn up between Sept. 23-30, with Sept. 27 as the current most likely re-entry date, according to program officials.

"Based on our previous experience with this type of spacecraft, we expect Lewis to burn up in the atmosphere. The probability that any part

of it will survive is very low, and it presents no significant threat to people on the ground," said Samuel Venneri, chief technologist at NASA Headquarters. "The potential loss of this mission is an obvious disappointment. However, the process of designing and building the spacecraft taught us a great deal about how to integrate cutting-edge technology into small missions and how to prepare the associated science teams, and we will apply those lessons to future projects."

Lewis was launched Aug. 22 from Vandenberg Air Force Base, Calif., aboard a Lockheed Martin Launch

Vehicle. Built by TRW Space & Electronics Group, Redondo Beach, Calif., the 890-pound satellite is part of NASA's Small Spacecraft Technology Initiative.

Initial operations and check-out of Lewis were proceeding satisfactorily until telemetry received early Aug. 26 indicated that the spacecraft was spinning at approximately two revolutions per minute. Preliminary indications are that unbalanced thruster firings occurred on the spacecraft, inducing a spin rate that went unchecked as Lewis remained in a previously commanded safe-hold.

The solar arrays on Lewis were

unable to generate significant power due to the spinning motion and their alignment with the Sun, and thus the spacecraft's batteries became almost fully discharged. Initial hopes that sunlight would "trickle charge" the batteries sufficiently to allow the spacecraft's transmitter and computer to be accessed were not borne out by subsequent operations.

Lewis' remote-sensing instruments were designed to monitor pollution, analyze endangered species habitats, estimate forest and agricultural productivity, map soil resources and assess impacts from energy pipelines.



**TEAM VISIT—**Sixty members of the United States Air Force Academy football team and their coaches watch a training exercise on the Manipulator Development Facility robot arm simulator in Bldg. 9 during a visit to JSC Sept. 5. In the background is the shuttle Full Fuselage Trainer. In addition to viewing the activities in the Shuttle Mockup and Integration Laboratory, the group met with a number of Air Force astronauts, including Tom Henricks.

JSC Photo 97-12054

## JSC workers run for breast cancer cure

A group of JSC employees is planning to participate in the 7th annual Susan G. Komen Breast Cancer Foundation "Race for the Cure."

According to organizer Jo Kines, at least 30 people from JSC participated in 1996, and more are expected this year. Race organizers reported 7,500 total participants last year, and expect 9,500 this year.

"Several of the JSC women who are planning to participate in the race are breast cancer survivors and many race in memory of loved ones who are survivors or who have died of breast cancer," Kines said.

The starting gun is set to fire at 7:30 a.m. Saturday, Oct. 4, 1997 at the Galleria in Houston. The event includes a 5-kilometer women's run/walk and a 1-mile family walk.

Kines said the JSC group is hoping to show support for the search for a cure for breast cancer and to be recognized as a team by wearing matching TEAM NASA T-shirts. The NASA group plans to meet for a photo at 7 a.m. on the day of the race in the northeast corner of the Galleria parking lot (near the Neiman Marcus store) at the intersection of Westheimer and Post Oak.

Entries must be postmarked by Sept. 23 (no faxes) and entry fees are \$17 for adults, \$10 for children 14 and under. Those who enter by Sept. 23 will receive a T-shirt. There also are a lot of pre- and post-race activities at the Galleria.

Anyone on-site may call Kines at x33218 or Melody Nation at x33152 or the Race at 713-850-9877 for a copy of the registration form or more information.

## Biology, plant growth experiments among Mir highlights

(Continued from Page 1)

"The importance of this program cannot be overestimated," Culbertson said. "This is where theory meets reality, where the practical lessons we learn aboard the Mir are already paying large dividends as we prepare to start construction of the space station in less than a year."

The launch of Wolf on the STS-86 mission continues a research program started with Dr. Norm Thagard's stay on Mir in 1995 and includes 35 scientific studies and technology demonstrations spanning six research disciplines. Wolf's flight furthers the continuous U.S. presence in space that began with Shannon Lucid on the STS-76 mission in March 1996.

At the start of Wolf's mission, the total U.S. astronaut time aboard the Mir will be 22 months—with 18 months of continuous occupancy since March 1996.

The loss of life sciences hardware due to a June 25 collision of a resupply vehicle with Mir will be partly offset by the launch of replacement equipment and by new techniques for achieving scientific goals. To date, some 120 U.S. scientific studies have been conducted aboard Mir by researchers from the United States, Russia, Canada, France, Germany, Hungary and Japan. Significant accomplishments from shuttle-Mir research include:

- Station researchers have learned to better monitor vital factors such as air and water quality and

radiation levels. These techniques have been validated and will continue to be used on the space station.

- Studies aboard the Mir have allowed more precise characterization of human physiology and psychology in space, in particular changes in bones and muscles, the neurovestibular system, the risk of developing kidney stones in space and changes in the interactions among crew members and their ground support team.

- Space flight-induced changes seen in muscles and bones are similar to those seen in bedridden patients and characterization of these changes in healthy crew members may lead to better methods of rehabilitation and treatment for patients on Earth. The shuttle-Mir

program has allowed NASA to evaluate the effectiveness of countermeasures the Russians have developed over 25 years.

- A study using new sensors has measured vibration levels of normal work routines and how that may affect sensitive microgravity experiment processing. The study, begun in 1996 by Shannon Lucid aboard Mir, has measured much lower vibrations on Mir compared with data obtained during Skylab.

- The promise of tissue culturing in space has been dramatically advanced aboard Mir. NASA was able to extend the duration of space tissue growth from 10 days to four months, with the successful culturing of cartilage cells in an onboard bioreactor.

## Two crews to transfer 8,000 pounds of supplies, equipment

(Continued from Page 1)

and Titov will secure a solar array cap on the exterior of the docking module since it won't fit through the Mir's hatch openings. The cap is needed to seal off the base of the damaged array on the Spektr module if and when the array is jettisoned by cosmonauts on a later Russian space walk.

Parazynski and Titov also will continue an evaluation of the Simplified Aid For EVA Rescue, a small jet-backpack designed for use as a type of life jacket during station assembly, and equipment designed to be compatible for use by space walkers on the U.S. and Russian segments of the International Space Station. Titov's participation in the space walk makes him the first foreigner to

participate in a space walk based from a U.S. spacecraft.

When *Atlantis* undocks from Mir, about 10:46 a.m. CDT Oct. 3, the separation maneuvers will use periodic stops to collect data for the European laser docking sensor. Once *Atlantis* is 600 feet below Mir, it will reapproach Mir to a distance of 240 feet while the station maneuvers to an orientation that provides adequate viewing of the damaged areas of its Spektr module. *Atlantis* will fly around to photograph the damage from the Progress collision and then perform a separation burn to move below and ahead of Mir.

An on-time launch on Sept. 25 and nominal mission duration would have *Atlantis* landing at 5:58 p.m. CDT Oct. 5.



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.

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Editor . . . . . Kelly Humphries

## Hurricane evacuation maps, tracking charts available at JSC

JSC's Emergency Preparedness staff is distributing important information regarding local area flood predictions for a hurricane storm surge and the associated evacuation time for Category 1-5 storms.

Detailed maps will be posted on bulletin boards for all employees.

In addition, about 3,000 hurricane tracking charts provided by KHOU Channel 11 are now available for all employees to pick up in the Bldg. 3 and 11 cafeterias. A number of the charts have been delivered to Ellington Field and the Sonny Carter Training Facility for distribution.

If JSC is threatened by a hurricane, employees will be kept informed through the Emergency Information Line at x33351 and the Public Affairs Office's Employee

Information Service at x36765.

All directorate and contractor emergency planning representatives also will receive direct notification and E-mail information as JSC hurricane preparedness "readiness levels" change. Supervisors and managers are encouraged to monitor the situation closely, and be prepared to initiate liberal leave policies for those with special needs. Employees should prepare their work area for a hurricane in accordance with the JSC Hurricane/ Severe Weather Plan, before leaving.

For more information, contact the JSC Emergency Preparedness manager, x34249; the American Red Cross, 281-282-6039; or the emergency management office in their community.