

December 1, 2000

SPACE CENTER Roundup

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JSC prepares for 50th anniversary of National Engineers Week

Opportunities for gift giving, volunteering, and sharing time with friends and family abound during the holiday season. For some, the inclination to give extends to their professional lives.

Each year, hundreds of JSC employees commit their time and talents to our many calls for community outreach, but National Engineers Week (NEW) holds a special attraction for NASA. The special challenges posed by human space flight attract the best and brightest engineers. NEW is dedicated to making people aware of the effect engineering has on our lifestyle and to encouraging children with a scientific bent to consider engineering careers. Talk to some of the volunteers and you'll find that taking time to visit students rekindles their own fires as well.

Kelle Pido, International Partners lead for ISS Safety and Mission Assurance says volunteering "gets me out of the office and the humdrums of day-to-day work. I come back so much more motivated. When the kids are all excited you realize, 'Wow - I really have a cool job.' I come back a better employee than when I left."

Pido, a 10-year NEW volunteer, finds younger students present a greater challenge.

"Their questions are so off the wall!" says Pido. "I'll be talking about space and they come up with questions about why do insects have six legs and spiders 8. You never know what you are going to get."

Pido and other volunteers use creative demonstrations to keep children's attention.

"I always try to do something that is hands-on," says Pido. "I have a short attention span myself so I know how theirs must be. The more kinesthetic the activity, the more they tend to pay attention."

Spirit of giving attracts E-Week volunteers

Systems Engineering and Configuration Branch Chief Tracy Minish, another longtime NEW volunteer, agrees. He sometimes employs 'shock value' to get their attention.

"I bring hands-on activities with me," explained Minish.

"Whether it's a shuttle model to walk them through liftoff and the different phases of flight to

such as flight controllers or crew instructors. It's a big community that supports what they see on TV."

Volunteers also try to break down the students' fear of the tough classes needed to pursue technical degrees.

Minish tells them, "It's like training to run a marathon. You have to

train and prepare a little bit each day. Math is the same way - it builds up."

Engineers Week organizers expect more than 200 people to volunteer. Many of them, like Joel Altman, come back year

students with furrowed brows trying to figure out how to do this. People who are absorbed in solving problems make good engineers."

Seeing that flickering spark of interest is what keeps many Engineers Week volunteers coming back.

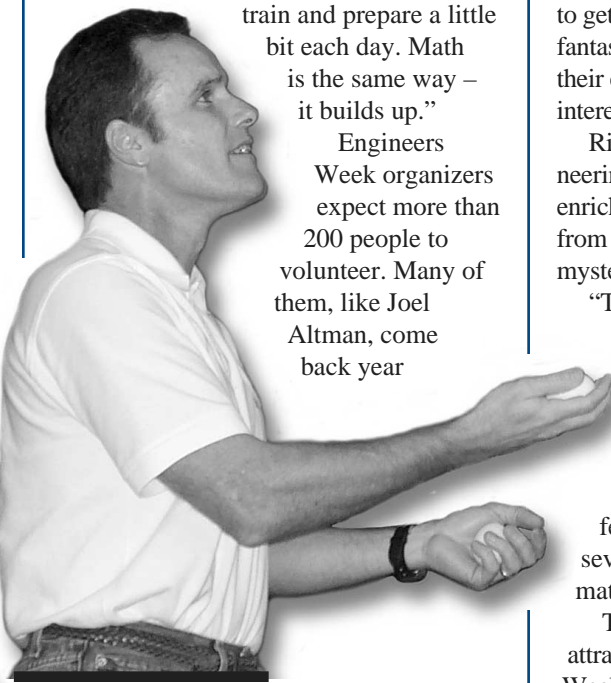
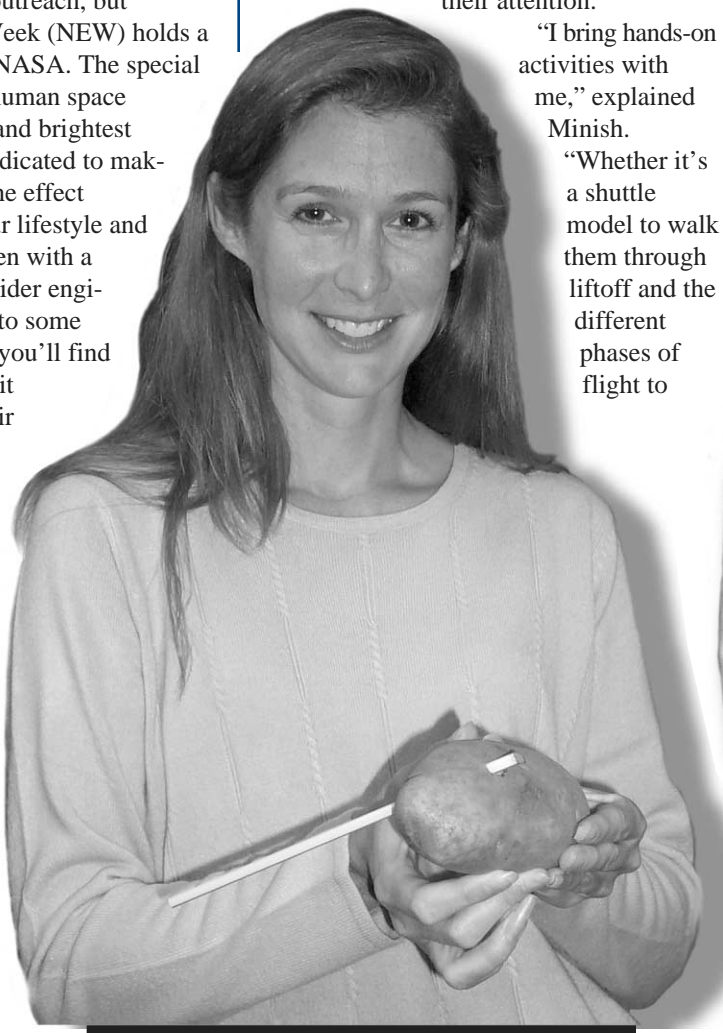
"It is a real boost to be able to do this," says Steve Rickman, deputy chief of the Thermal Branch in the Structures and Mechanics Division, who says he tries to get involved however he can. "It's a fantastic experience. You can feed off of their enthusiasm. They take a genuine interest in what you do for a living."

Rickman uses his time during Engineering Week to convey to students the enrichment and satisfaction that can come from pursuing your interests, such as the mysteries of math.

"The older I get, the more fascinated I am by mathematics and I try to share that," explained Rickman. "With the high school students, I give them math challenges and try to leave them with something inspirational, like the story of Professor Andrew Wiles who dedicated seven years of his life to prove Fermat's Last Theorem."

There are several motivations that attract people to volunteer for Engineers Week but the common thread is the investment in our youth and the mentoring of our nation's future scientists and researchers.

"It's such a positive experience," says Rickman. "I believe the best legacies we can leave our children are an education and the benefit of our experiences."



Showing students the fun side of math and science is one of the ways National Engineers Week volunteers help attract young people to careers in engineering. Shown here, clockwise from left, are JSC volunteers Kelle Pido, Tracy Minish, and Joel Altman.

after year. Altman, an applications programmer with Lockheed Martin, wants to get more students involved with engineering.

Altman created an interactive exercise, using Tinker Toys and an intercom.

"I divide the class into two groups: astronauts and flight controllers. The flight controllers get a model Mars rover, while the astronauts get a box of parts."

After the astronauts construct their rover, from the flight controllers' verbal instructions, Altman gets the two groups together to compare the rovers.

"The most rewarding time," Altman says, "is seeing



“My favorite part of doing this is just being with the kids and knowing something good happened here today.”

- Kelle Pido

more interactive experiments, such as the Alka Seltzer rockets. You pretty much can get everyone's attention when you shoot off rockets in a classroom."

Minish says he ties in a bit of humor to his presentations to

"encourage more students to think about math and science."

"I try to show them what opportunities are out there," said Minish. "There are exciting jobs aside from being astronauts,

For more information on how you can be a part of JSC's commitment to National Engineers Week, visit <http://www4.jsc.nasa.gov/scripts/eweek/>.



Key station element delivered to shuttle team.

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Latest NASA technology wows inspection crowd.

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Wireless system reduces spacecraft load.

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NASA shuttle integration team accepts delivery of space station element

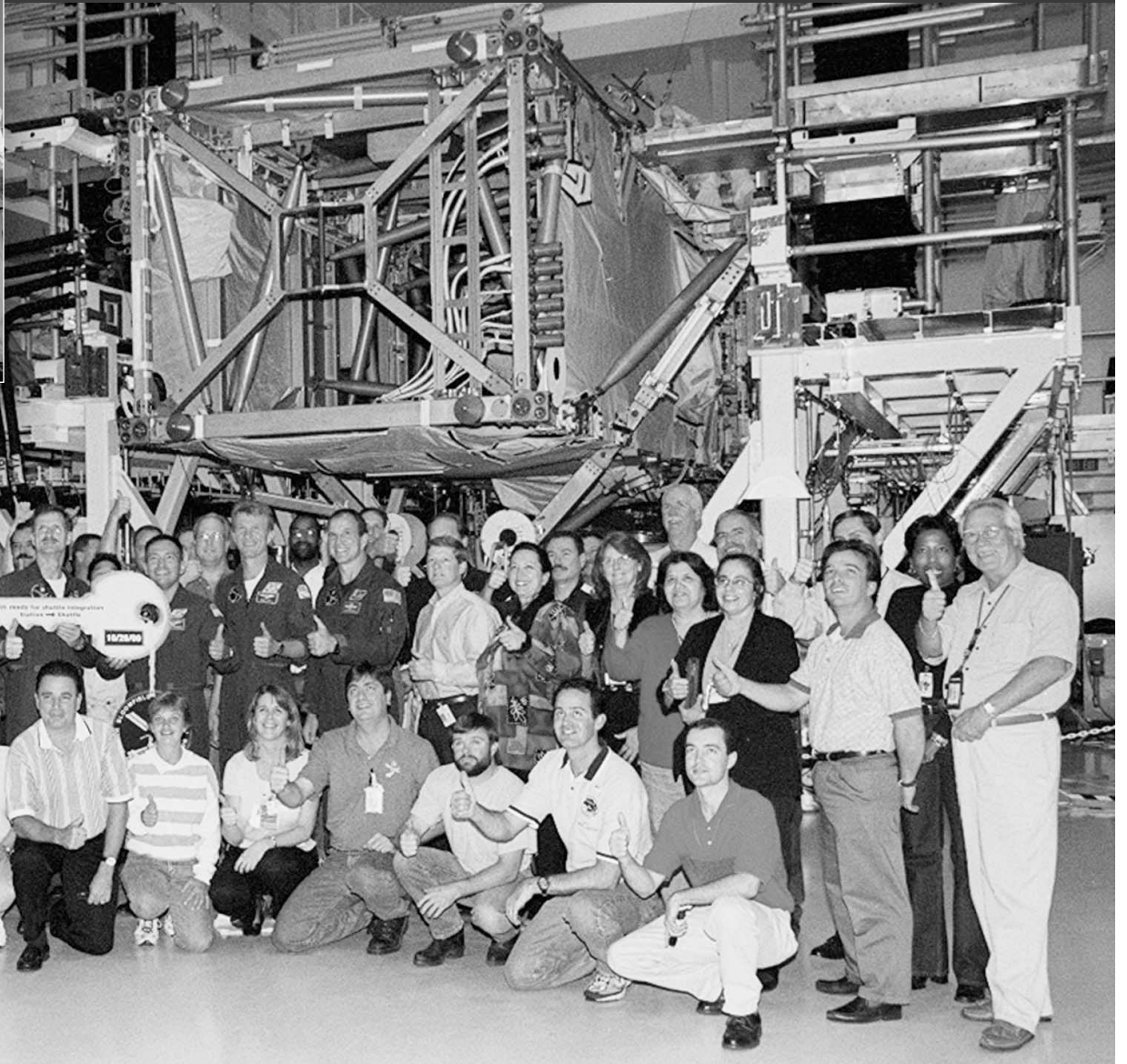
During a recent ceremonial key exchange at Kennedy Space Center, the P6 Truss segment was transferred from the International Space Station ground operations to the NASA shuttle integration team.

In addition to the Boeing and NASA employees who participated in the ceremony, the STS-97 astronaut crew

that includes Commander Brent Jett, Pilot Mike Bloomfield and Mission Specialists Carlos Noriega, Joe Tanner and Marc Garneau was on hand to thank employees for their hard work.

The P6, which is the backbone of the U.S. electric power system for the ISS, will be delivered by Space

Shuttle *Endeavour* during STS-97, station mission 4A. The segment consists of a long spacer structure and an Integrated Equipment Assembly that will carry two 115-foot solar arrays, radiators and other equipment to receive, condition, store, distribute and control electric power. ■



Workers in the Space Station Processing Facility gather with the crew of mission STS-97, who are holding the symbolic key representing the turnover of the P6 Integrated Truss Structure, part of the payload on their mission. Commander Brent Jett (second from right, in flight uniform) received the key in the ceremony. Standing with him are (left to right) Mission Specialists Marc Garneau, Joe Tanner and Carlos Noriega, at left; and Pilot Mike Bloomfield, at right. At present time STS-97 was scheduled for launch November 30 at 10:05 p.m. EST. Inset: from left, 4A Commander Brent Jett, Bill Dowdell, 3A/4A mission manager for NASA, accept the ceremonial key for P6 from Mark Sorensen, 3A/4A outboard truss cargo element manager for Boeing; and John Elbon, Boeing ISS director of ground operations at KSC.

Tree planting memorializes Astronaut Conrad

Family, friends and space program employees, past and present, assembled at JSC November 9 to commemorate the life of Astronaut Charles (Pete) Conrad and forever memorialize his role at NASA's Center for Human Space Flight.

Nancy Conrad, Pete Conrad's widow, planted a Live Oak tree in his name at JSC. Conrad's sons – Pete, Andy and Tom – also were in attendance for the event. Fellow Astronauts Alan Bean, Paul J. Wietz, Buzz Aldrin and Charlie Precourt addressed the audience and spoke of their fellow space explorer.

A T-38 flyover concluded the public ceremony. Afterwards, the family was given a formal tour of JSC.

Conrad was a veteran of four space flights and set several records at that time, including space endurance and world altitude records. As commander of the second lunar landing mission, Apollo XII, Conrad became the third person to walk on the Moon. He is also noted for his role as commander of the nation's first space station, Skylab.

Conrad died July 8, 1999, at age 69. ■



NASA JSC Photo 2000-07164 by Robert Markowitz
At left, Andy and Pete Conrad, sons of Astronaut Charles Conrad, assist Nancy Conrad as she plants a ceremonial Live Oak tree on the JSC campus to memorialize the life and contributions of her late husband. Partially obscured by tree is Tom Conrad, another son.

Volunteers needed for resistive exercise study

The Human Test Subject Facility is recruiting nonsmoking males between the ages of 25 and 40 to participate in an 18-week training study. This study will be used to evaluate the effectiveness of a new resistance exercise machine that is planned for use on the International Space Station.

Test subjects will be given a Class III physical in Bldg. 37 in the HTSF and must also pass a Bruce treadmill test. Subjects should be active and have no history of back pain, muscle weakness, hernias or high blood pressure. Subjects must not have been involved in any weight lifting programs for the previous six months.

Investigators will begin collecting pretest data before the holidays. The study will run from January through April. Test subjects must be able to commit to an 18-week study, a portion of which will involve a period of training three times a week for 16 weeks. Volunteers may be compensated for participation, though restrictions apply to NASA and NASA contractor personnel.

Those interested in participating may call the HTSF at 483-7240 or 483-7284. ■

Three recognized for lifesaving efforts at Open House

When Marjorie Johnson, a supply control clerk with Brown & Root Service Pioneer, participated in CPR training this summer, she anticipated that some day the course would be valuable but she didn't expect to use it the very next month to save someone's life.

Many of us recall the afternoon of August 26. JSC was overflowing with visitors, volunteers and staff taking part in the center's Open House event. Shelia Popillion and Greg Warfield, both employees of Tolman, were driving to an assignment when they noticed a commotion near Bldg. 47. A woman had collapsed and her grandson was trying to rouse her. The two turned their vehicle around and went to the site to see how they could assist.

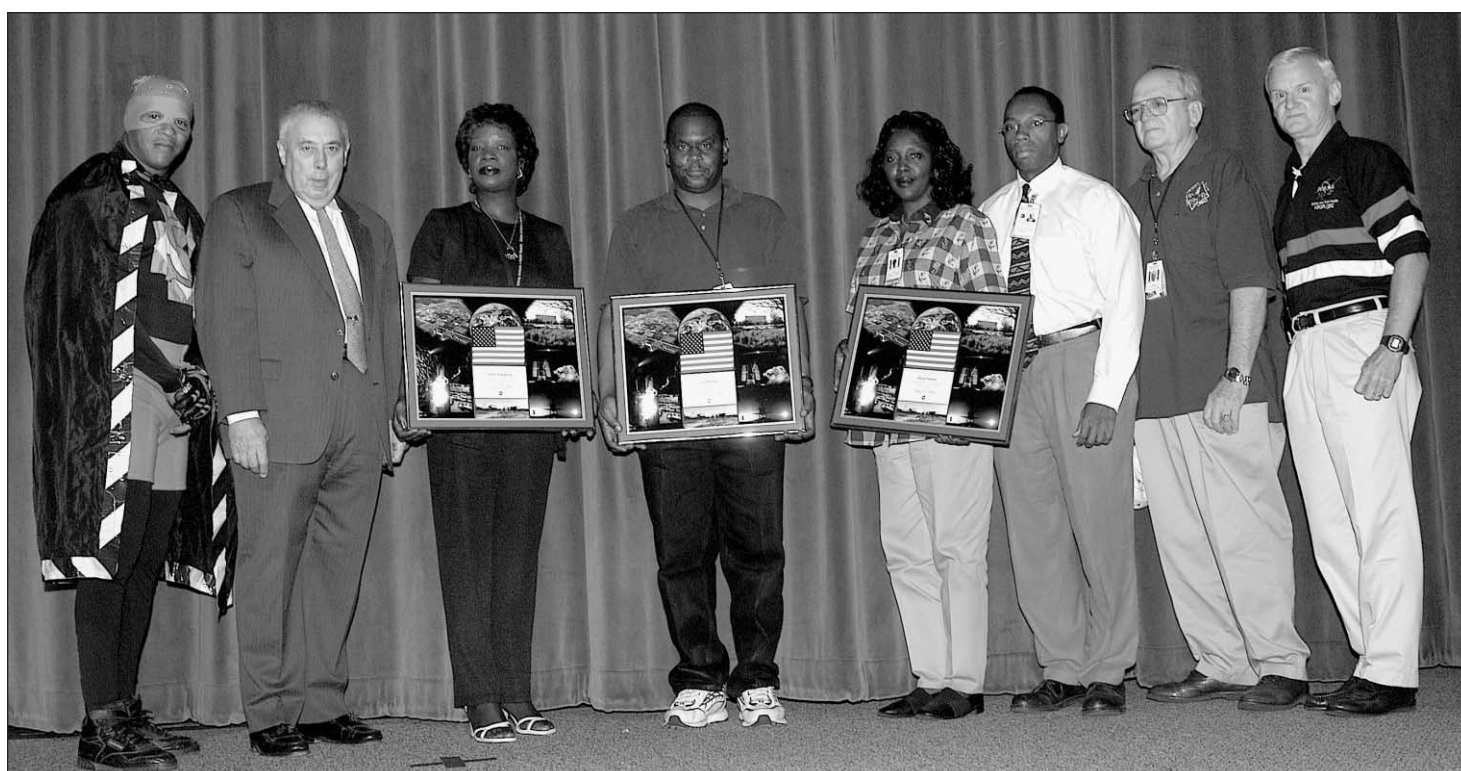
"We could not get her to respond," said Warfield. "She was pale, not sweating at all and her eyes were like glass. I thought she had a heat stroke and ran to get wet towels for her head. In the meantime, Shelia went to flag down a security officer."

Johnson was at a nearby booth when a coworker directed her attention to the emergency.

"There was a woman laying face down in the grass, and at that point I had a coworker call for emergency assistance on his radio," explained Johnson. "We turned the woman over so I could check if she was breathing. It was so noisy, I couldn't hear anything but I could tell she was not breathing."

Johnson then began performing CPR on the victim. Within just a few breaths the patient began breathing on her own but still lapsed in and out of consciousness until the paramedics arrived.

"I spent a lot of time talking to her, trying to get her to keep her eyes open," said Johnson. "Her breathing was very



NASA JSC Photo 2000e26818 by Robert Markowitz

Shown here, center holding plaques, are Marjorie Johnson, Greg Warfield and Shelia Popillion who stepped in to save a life during JSC's Open House. The three were recognized by Center Director George Abbey and SR&QA's Director John Casper during a special ceremony at Safety & Total Health Day for their actions. Left to right, SafetyMan, Abbey, Johnson, Warfield, Popillion, Nathan Wright, acting director, Center Operations Directorate, Richard Castleberry, general project manager for BRSP, and Casper.

shallow and we couldn't get a response from her. It was a very frightening experience and I can tell you I was very relieved when the paramedics arrived."

The patient was taken to a nearby hospital and released under doctor's care later that week but the memory remains with Johnson, Warfield and Popillion.

"I am very appreciative of the opportunity to be able to assist in situations like this," said Johnson, who had just completed a CPR course in July through BRSP. "So many times, people don't want to take chances to risk helping others and they make excuses but that doesn't help solve the problems." ■

What should you do?

When you find someone in distress, the steps should be:

1. Call 911. If you are on site at JSC or Sonny Carter Training Facility call x33333, Ellington Field, x44444.
2. If the victim is conscious try to make them comfortable until help arrives.
3. If the victim is unconscious, check for breathing and a pulse.
4. If the person is not breathing or no pulse is found, initiate CPR.
5. Continue CPR until medical help arrives.
6. Stay at the scene to provide information to medical personnel.

Through its "Got the Squeeze, Call the x33333's" Heart Disease Awareness and CPR Training Initiative, JSC Occupational Health and Test Support offers several CPR and related heart disease awareness courses.

For more information call the JSC Occupational Health Clinic at x34111.

JSC scientist receives Presidential Early Career Award

Dr. Janice Yelle, NASA scientist and head of the JSC Cardiovascular Laboratory, has received a 2000 Presidential Early Career Award for Scientists and Engineers. The award was presented on October 24 in Washington, D.C., at the Executive Office Building adjacent to the White House.

"I was delighted to hear that I had been selected for this award," said Yelle. "Everyone in the lab was delighted. This is a tremendous honor."

Upon being informed of her selection, Yelle immediately sent an e-mail to her colleagues informing them that the award was for all of them. "This lab is fantastic. We function as a team. We all received the award."

NASA Headquarters nominated Yelle for the award for research in the area of cardiovascular adaptation to space flight. Yelle says that she will use the two-year monetary award to buy equipment and hire personnel for the lab. A portion of the funds may also be used to extend current grants that are due to expire next year.

Of particular interest to researchers in the JSC Cardiovascular Laboratory is the study of orthostatic hypotension – the inability to maintain adequate blood pressure while standing – a problem that affects many astronauts upon return to Earth. The award money will help scientists further study this problem.

"We've spent a lot of years studying this issue, and we've made some progress trying to determine the mechanisms of this problem and what we can do to fix it," says Yelle.



NASA Administrator Daniel Goldin, Dr. Janice Yelle, and NASA Chief Scientist Kathie Olsen

Most researchers and scientists are interested in hypertension (abnormally high blood pressure) because it adversely affects the heart. But according to Yelle, hypotension (abnormally low blood pressure) is a problem as well albeit in a smaller population of people. Its effects can be very debilitating.

Yelle shares information with researchers at the University of California at San Diego, Mayo Clinic and Vanderbilt University who are working with patients suffering from hypotension. "Everybody is so intellectually interested in space flight because it is so unique.

You have these perfectly healthy people who return from space and they look like these patients. And three days later they are fine again, but the patients never return to health. If we can figure out how these healthy people deteriorate and then spontaneously recover, we might be able to help the patient population." Conversely, she can ask the researchers what they are doing to help their patients and then apply some of those treatments to the lab's work with the astronauts.

Head of the JSC Cardiovascular Laboratory for the past eight years, Yelle earned her doctorate in pharmacology from the University of Texas Medical Branch last

May. She became eligible for the award upon receiving her doctorate.

She says that she always wanted to earn a doctorate. "I needed the additional education. I knew that I was lacking in some areas. My thinking is more sophisticated than it was when I earned my master's degree back in 1982 at Virginia Commonwealth University.

"I give JSC the credit for enabling me to earn my doctorate. JSC arranged the schedule so that there was no way that I could fail. All I had to do was pass." And pass she did, graduating with a 4.0 grade point average. Now she is working with UTMB to help establish a doctoral program in space physiology.

Yelle hopes to build the JSC Cardiovascular Laboratory into something even better than it is. "It is already fantastic, but I would like to attract more senior people here to come and visit."

The award is just a stepping-stone on the way to greater achievements, Yelle says. "I don't consider this award the highest thing I'll ever achieve. I consider it just the beginning."

Recipients were chosen from nominations submitted by agencies of the federal government through which each has current funding. The Office of Science and Technology selected this year's 59 recipients, including six from NASA. The recipients represented all of the federal funding agencies eligible to submit nominations.

Yelle was the only NASA recipient cited for her work in the life sciences, the others cited for their work in the physical sciences. ■

Inspection2000 features latest in NASA technology

From the latest in robotic grasping technology to a revolutionary drug delivery system that provides a new way of delivering multiple drugs to vascular tumors, visitors to Inspection2000 were exposed to the latest in NASA-developed technologies. The event was held November 1-3 at the Johnson Space Center.

"I saw some of the finest technology and people developing it in the world," said Doug DeMatthew, an engineer with General Electric Company. "I didn't know NASA was involved with as many commercial applications of space and commercial applications in general."

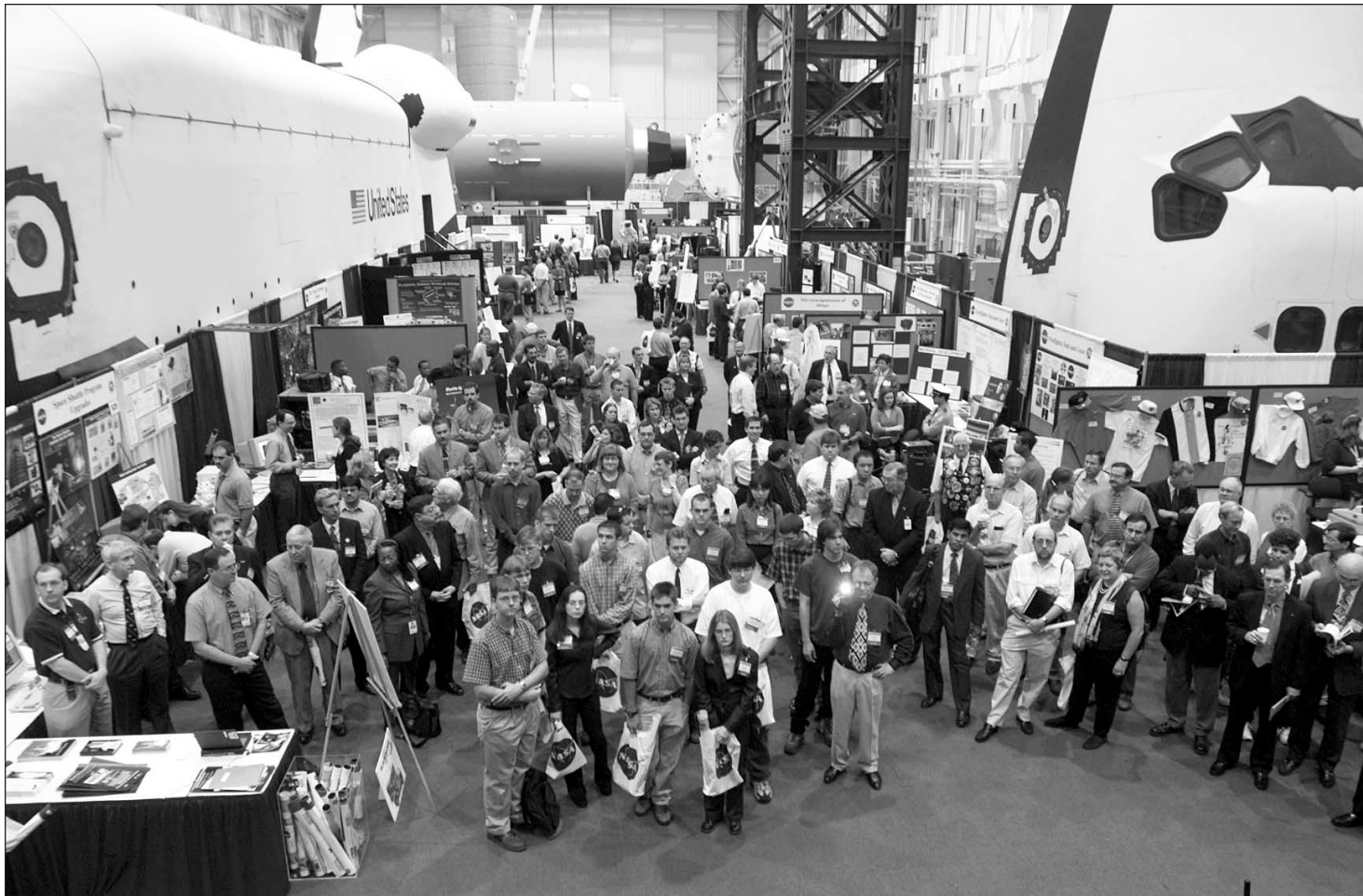
More than 2,100 professionals from industry, academia, government and the community took advantage of the three-day event to talk with NASA representatives and investigate opportunities to apply space technologies to their own endeavors. People from 28 countries, 42 states, U.S. Virgin Islands and Washington, D.C. pre-registered to attend. Guest feedback has been very positive.

"For the general public and people who are more technically advanced and knowledgeable about what goes on at NASA and the many programs at NASA, this has been a down-to-earth and enlightening experience that gives the reality of what goes on in the space program a real human touch as well as a technical touch," said Inspection visitor John Gardner, assistant director, Nevada Space Grant Consortium.

Many technologies on display have made or will soon make their way to the commercial market via the Small Business Innovation Research program. Through this program, small businesses receive funds for innovative concepts that meet NASA's technical requirements.

One such area of success involves carbon nanotubes, materials that are 10 to 100 times stronger than steel at one sixth the weight.

Through the SBIR program, researchers at ReyTech Corporation in Bend, Ore., are using nanotubes that JSC and Rice



NASA JSC Photo 2000e28304

Inspection2000 visitors check out the many exhibits on display in Bldg. 9.

Inspection guests catch a glimpse of the robot cycling through Bldg. 9.



NASA JSC Photo 2000e28311

University scientists produce to make high-performance capacitors. NASA would like to use these capacitors in tandem with batteries for applications where a strong, quick burst of energy is needed. Normally, a quick burst of energy cannot be delivered by the battery or it would drain the battery causing other systems to shut down. Using this new technology, the nanotube-based capacitor handles the high current surge for

a short period of time and the battery then provides sustaining energy.

"The concept is to use a capacitor, in conjunction with a battery, so that the life of the battery can be extended and the weight of batteries to be launched into space can be reduced," explains ReyTech Director of Research Curtiss Renn. "We are using the nanotubes because they demonstrate long-term stability, have high energy and power capabilities, and are electrically very conductive."

Brad Files, JSC nanotube project lead, remarks, "It's great to see some early applications of nanotubes to go with the longer-term breakthrough possibilities."

On the commercial market now and developed under an SBIR project, the Biclops is a three-axis motion-control platform for aiming multiple cameras. The device has wide applications in the security industry.

"People can use this system in combination with software and hardware to track people as they walk through a room," says Bryn Wolfe, a robotics engineer with Metrica, Inc., of Houston, the firm that is marketing the product. "The initial intention of using this system was to track astronauts in space. We're trying to commercialize this capability for use in security systems. We're trying to get the technology to the point where people can use it in their homes. They'll be able to plug it into an outlet and hook it up to a VCR. It will keep track of activity on their property."

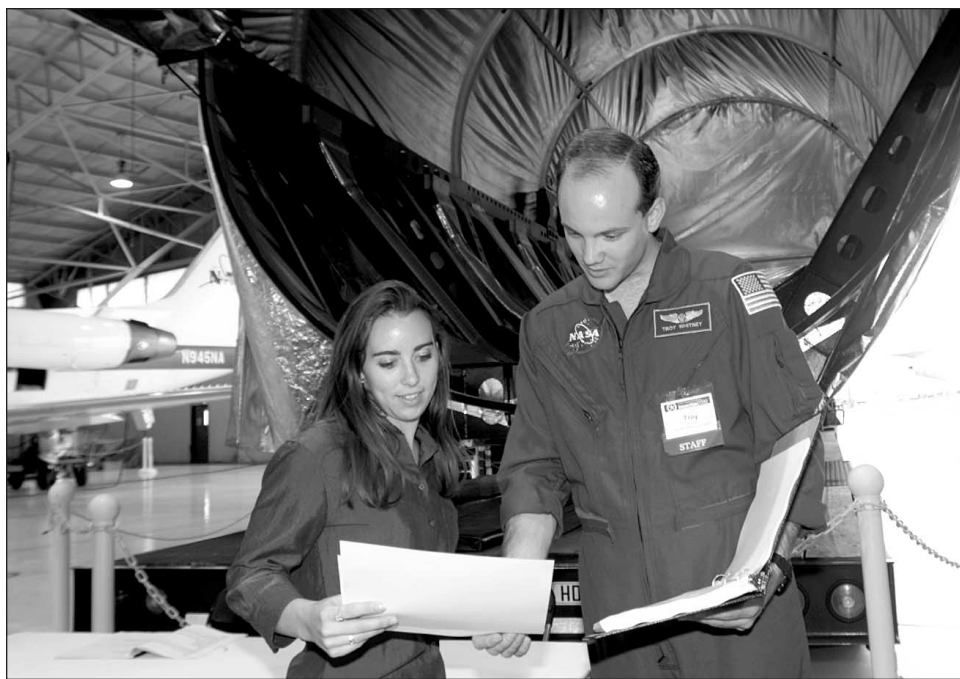
Many Inspection visitors were seeing not red but infrared in Bldg. 9. The latest in infrared imaging technology, part of an exhibit on firefighter suits and equipment, featured a small infrared camera that has the potential for numerous applications in space and on Earth. It can supply International Space Station crewmembers with a mini-heads-up display mounted in their portable breathing apparatus mask so they can see through a smoke-filled cabin, execute fire suppression operations as need be, or find their way to the X-38. In the near future, the technology may provide terrestrial firefighters with a small, hands-free

Please see **INSPECTION2000**, Page 5



NASA JSC Photo 2000e28309

Rick Medina, right, discusses the articulating foot restraint used by astronauts during space walks with Inspection guests Jairo Ariza and Elizabeth Ariza.



NASA JSC Photo 2000e28312

Brandy Quarles and Troy Whitney were on hand to tour guests through Ellington Field.

Continued from Page 4

Inspection2000

display mounted in their helmets from a camera under their mask that would allow them to see through fire and smoke.

"There is so much work being done with NASA-derived and Department of Defense-derived infrared technology that we are looking into the possibility of executing a Space Act Agreement with a commercial vendor that has a very small camera that is suitable for use by firefighters," said Harold Moffitt, NASA shuttle flight controller and lead for infrared imaging technology. "We can take their camera, repackage it, and apply NASA/JSC expertise in infrared imaging applications to develop a commercially viable product that could also be flown on the space shuttle and the International Space Station."

An infrared camera on display during Inspection is scheduled to be flown during STS-100 next April to provide ISS crewmembers with the capability of finding hot spots, cold spots and leaks within the station modules as well as providing them with night vision capability. The next step is to put a camera into a housing and put it into the orbiter payload bay to provide the astronauts with night vision capability. An infrared camera could be in firefighters' hands late next year.

Many NASA centers and facilities took advantage of Inspection to make technical points of contact. Stennis, Kennedy, Ames, Glenn, Dryden, Marshall and Goddard had numerous exhibits at the event. Approximately 64 exhibits were provided by other NASA centers, universities, and industry.

JSC's White Sands Test Facility had a prominent exhibit in Bldg. 9 featuring its work on meteoroid and orbital debris

protection, hypervelocity impact testing and fire hazards associated with oxygen systems. WSTF personnel are working with professionals in many industries to apply their expertise, train employees and develop new products.

"We're working with the medical industry to improve the design of medical regulators, the aerospace industry to help train employees in the maintenance of oxygen systems, and the American Society for Testing and Materials to develop and teach courses on how to design and operate oxygen systems safely," said NASA WSTF Projects Engineer Miguel Maes.

Inspection2000 featured exhibits of interest to everyone from the aviation enthusiast to the educator. Many visitors took advantage of guided tours of various JSC sites, a new addition to this year's event.

NASA's Super Guppy aircraft used for transporting station components as well as the Shuttle Training Aircraft, the 747



NASA JSC Photo 2000e28307

Ed Powers, left, discusses growing plants in space with John Gruener.

Shuttle Carrier Aircraft and the T-38 aircraft used for training shuttle astronauts were all on display at Ellington Field. Educators attending the event discovered the latest in JSC learning technologies from a Web-based simulation developed for K-12 students

to design, build and run robots in a virtual environment on line to the intelligent math tutor, a Web or CD-ROM tool for self-paced learning of college or pre-college math.

Lynda Garrett and Alice Snyder, science teachers at Gamble Rogers Middle School in St. Augustine, Fla., attended all three days of the event.

"We've learned a lot of information to take back to our students in Florida," said Garrett. "It's been a wonderful experience. Everyone has been so willing to explain things to us in terms that we can take back to the students."

"It was just incredible to be up in Mission Control this morning after the docking knowing that there are astronauts actually living in the space station," added Snyder. "It's an amazing thing." Snyder attended the event for the third year.

Making its debut in conjunction with Inspection2000, the University Engineering Summit attracted 35 attendees including vice presidents of research, deans of engineering schools, and professors. The purpose was to let the university engineering community know about NASA's research projects and to explore how government and academia might better work together to develop the nation's workforce.

"The agency has initiated a program to engage more closely with the university community, not just for research but to develop the workforce of the future – the scientists and engineers who will take us out in space exploration," said Dr. Bonnie Dunbar, JSC assistant director for university research and affairs. "This conference was one of the milestones on that road. We're very pleased with the outcome. The participants want it to continue to happen, we're not going to let it end here, and we're looking forward to growing it in the future."

Scores of volunteers, some of the 1,983 who volunteered to make the event a success, are now following up on the hundreds of requests for additional information from Inspection2000 guests.

"We received 600 Technical Assistance Requests," said Charlene Gilbert, Inspection2000 chair and acting director, Office of Technology Transfer and Commercialization. "Through everyone's hard work and support, the event was a success. The guided tours were new this year, and they were practically sold out every day. All of the operations ran smoothly, and we didn't have any close calls or safety incidents. Even though attendance was lower than we desired, it was our target audience. We had professionals from companies such as Continental Airlines, Baker Hughes, Nike, Coty, Wells Fargo and Nippon Steel. Most of the TARs are asking for specific technology information, and we received some very good leads during Inspection2000." ■



NASA JSC Photo 2000e28314



NASA JSC Photo 2000e28308



NASA JSC Photo 2000e28306



NASA JSC Photo 2000e28313

1. AI Goodman takes a virtual reality tour.
2. Lorraine Benavides discusses the medical kits carried aboard the space station with Vinodbala Shah.
3. Dr. Roger Marion and Elizabeth Roland examine the latest in sensor-based systems and related technologies used for space flight and ground-based clinical, medical, and surgical needs.
4. Dr. Rengchy Lor and Carl Koontz examine photographs of how station components are loaded aboard the Super Guppy.

Ripped from the ROUNDUP

Ripped straight from the pages of old Space News Roundups, here's what happened at JSC on this date:

1 9 7 0

Sharing a tank of compressed air on the way back to the surface is a standard emergency procedure among SCUBA divers. The mouthpiece is passed back and forth between the two divers who share the air remaining in a good air tank – called logically, the “buddy system.”

The buddy system approach has been adapted to moonwalks through the use of connecting lines that feed cooling water from an astronaut's backpack life support system to the spacesuit worn by his companion. The connections would give both astronauts enough time to return to the lunar module if the water cooling system of one of the backpacks failed.

1 9 8 0

JSC's new Weightless Environment Test Facility (WET-F) in Bldg. 29 opened for operation November 21, hosting an average of four crew training runs and one engineering run per week.

Neutral buoyancy simulations of weightlessness date back to the mid-60s when one of the Gemini astronauts had problems conducting a procedure outside the spacecraft even though he had run through the procedure flying parabolas in the KC-135 aircraft.

Realizing that astronauts needed more than the average 20-second parabola to test procedures, crew trainers looked into underwater neutral buoyancy experiments then taking place in Pennsylvania.

1 9 9 0

A new Shuttle Carrier Aircraft winged its way into the NASA fleet last week as the modified Boeing 747 flew from Wichita, Kan., to Ellington Field en route to its home in El Paso.

Before joining the NASA fleet, the 747 served as a domestic passenger aircraft for Japan Air Lines. Boeing acquired the aircraft for NASA in 1988, and modifications were begun.

When mated with an orbiter, NASA 911 cruises from 13,000 to 15,000 feet, but can increase its altitude to a cruising level of 24,000 to 26,000 feet when unmated. It has a range of 1,000 nautical miles when mated and 5,500 when not mated.



JSC observes Native American Month

Dancers from the American Indian Resource Center performed on November 8 in the Bldg. 3 cafeteria as part of JSC's Native American Month Observance.

The dancers represented many facets of the American Indian community, from Creeks to Huastecas, from Apaches to Cherokees. The presentation was designed to demonstrate the beauty and dignity of American Indian culture, as well as to inform the audience about contemporary Native American life.

The American Indian Resource Center educates the Native American and non-native communities about contemporary American Indian issues. Through lectures, cultural presentations, ceremonies, and direct action, the organization works to establish better communications between individuals and groups. Its goal is to improve the self-esteem and educational achievement of Indian youth as they interact with the larger non-Indian world. ■



Montage of NASA JSC Photos by Robert Markowitz

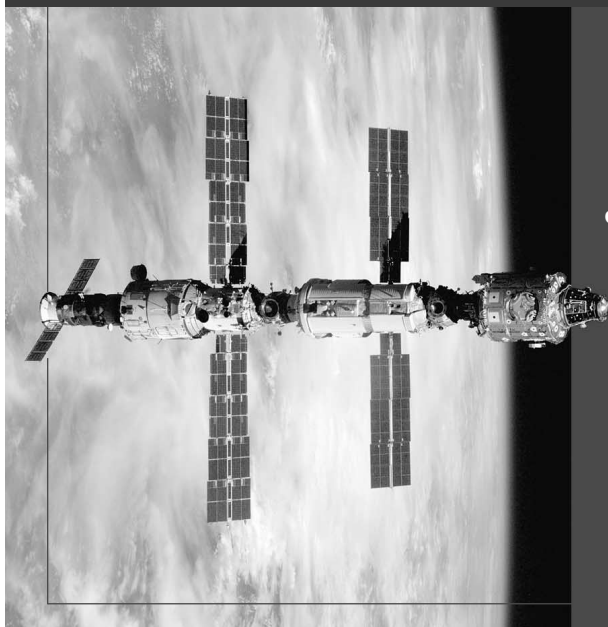
All JSC employees and contractors are cordially invited to a preview of *Inside the Space Station*

a Discovery Channel documentary

in the Teague Auditorium

Thursday and Friday, December 7 and 8, 11 a.m. and 1 p.m.

Make the journey with us *Inside the Space Station* and...



Experience one of the most ambitious engineering feats ever attempted.

Meet the people who have banded together, despite cultural differences, to take on a project that no one nation could accomplish alone.

Relive the incredible technological obstacles that astronauts and scientists from around the globe have had to overcome.

Learn firsthand how this spirit of adventure will impact our lives.

Holiday Dinner/Dance tickets on sale

You better not cry, you better not pout. Tickets to the Employee's Activities Association Annual Holiday Dinner/Dance are out! The event will be held December 9 at the Gilruth Center.

Tickets may be purchased through 3 p.m. December 6 in the Bldg. 11 Exchange Store. Tickets are \$25 per person or \$45 per couple. Tickets are available to NASA employees, retirees, and contractors. Six guests per table are preferred. Seating for eight is available.

This year, partygoers will be entertained by the sounds of The Houston Society Jazz Orchestra providing a variety of music. Your evening will begin with a social period at 7:30 pm, followed with buffet-style dinner at 8 p.m., then on with the band and dancing the night away with friends and family until midnight.

You will be feasting on prim rib with veggies and assorted desserts, tea and coffee. ■

For additional information please contact Rose Gardner at 281-483-0331.

TICKET WINDOW

The following discount tickets are available at the Exchange Stores

AMC Theaters	\$5.00
Moody Gardens (2 events) (does not include Aquarium Pyramid)	\$10.75
Moody Gardens (Aquarium only)	\$9.25
Space Center Houston adult . . \$11.00 child (age 4-11)	\$7.25
(JSC civil service employees free.)	
Space Center Houston annual pass	\$18.75
Postage Stamps (book of 20)	\$6.60
Entertainment Books	\$20.00
Franklin Planner refills (Classic Style)	\$25.50
Franklin Planner refills (Seasons and Montecello)	\$30.25
Holiday gift wrap available December 1 to December 15	
Come see our great gift ideas for the holidays!	

Check out our new Website on the JSC People page at: <http://hro.jsc.nasa.gov/giftshop/>

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Keystone Committee keeps White Sands Test Facility aware of safety

By **Cheerie R. Patneau**

White Sands Test Facility's Keystone Committee has established the site's OSHA Voluntary Protection Program committee to raise safety awareness in employees and to help the site prepare for the Star certification.

The Keystone Committee, an employee-based committee chaired by Honeywell Technology Solutions Inc. employee Holger Fischer, has established safety awareness projects, worked on the site's Safety and Total Health Day activities, and compiled the evidence for the site's Star application. The application must address the major elements of the program: Management commitment and meaningful employee involvement in safety and health at the site; worksite analysis for hazards; hazard prevention and control; and employee safety and health training. The site has also conducted its mock-VPP audit, with auditors from other Star sites analyzing WSTF's programs.

Establishing the criteria for Star certification is a tough endeavor for any site, as is demonstrating how safety and health programs reduce injuries and illnesses. NASA WSTF Manager Joseph Fries has adopted a "common sense approach" to address the mock-audit findings. Of the findings, he believes that the most challenging are the worksite analysis for job hazards and ergonomics. He believes that "we have a lot of hard work ahead of us for Star certification, but we are improving." He establishes the criteria for addressing the findings by saying, "I don't want a lot of forms that go in a book. I want more living documents that have meaning for our employees." Of the ergonomic finding, he said, "this presents

more of a challenge, but training in the use of our existing equipment will help us."

Recently, the Keystone Committee attended the National Voluntary Protection Program Participants Association's conference which celebrated "Soaring Beyond the Star" and stressed exceeding previous achievements, and challenged participants

relationship are the envy of other federal agencies." He stressed that we should, "talk with those who've been with the program from the beginning as well as those who've joined recently. You'll discover the myriad benefits of VPP, including what we are most proud of, the dramatic reductions in injuries and illnesses. We hope you will



Noted Notre Dame football player "Rudy" Ruettiger encourages audiences to overcome challenges to attain their goals. Shown here is WSTF Manager Joe Fries and wife Sue with Ruettiger, center.

to set higher goals. While the WSTF Keystone Committee can only appreciate the goals of the conference now, the main speakers were inspiring to the committee members attending the conference.

Guest speaker Charles N. Jeffress, assistant secretary for occupational safety and health, U. S. Department of Labor, said that "trust, cooperation, the generous sharing of resources and expertise that mark our

make the effort and set your sights on the Star. It's a winning formula for everyone."

Daniel "Rudy" Ruettiger, the conference's closing speaker, also set higher goals than his classmates and fellow workers at the power plant in Joliet, Illinois. Rudy challenged himself to pursue his dream of playing football for the "Fighting Irish" of Notre Dame University, "despite a poor academic record, mediocre athletic

skills, and very little encouragement from his family." Ruettiger overcame his challenges, as catalogued in the movie *Rudy* which premiered at the White House.

Ruettiger has subsequently given himself new challenges: working with children. He has established Rudy's Kids, a foundation to help children achieve character, commitment, and courage. Ruettiger didn't listen to discouragement; he soared beyond it.

Lee Anne Jillings, executive director of the National VPPPA, said that the feedback she received from the 1,750 attendees to the conference was very "positive, with the most benefit in networking." Jillings felt that Ruettiger's presentation was "great! Motivating!" The conference also carried 1 to 3.5 continuing education credits. Jillings said that the next annual VPPPA conference will be held in New Orleans August 27-30, 2001.

Members of the WSTF Keystone Committee are: Victor Meza, John Bernal, Robert Cort, James Wing, Donald Hall, Marc Dunford, Jose Lopez, Ed Havenor, Jill Rollings, Cheerie Patneau, K. C. Schlotterbeck, Holger Fischer, Richard Vonwolff, Danny Aranda, John Kelley, Eric Crespin, Case Van Dyke, Raul Estrada, and Jesse Wells.

The Keystone Committee has found throughout its year of commitment to the health and safety of WSTF's employees that the site is rising to the challenge of achieving its Star. Additionally, the Keystone Committee has attained recognition for its work in safety and health. Each charter member has received a NASA Certificate of Exemplary Performance. The committee continues to set safety awareness goals, work with the mock-audit team, and ready the site for the February 2001 OSHA Star application. ■

New wireless technology may pull the plug on weight gain

A simple challenge over dinner may have led to one of the most effective remedies for weight gain and added costs for instrumentation aboard the International Space Station, upgraded shuttle and NASA's future vehicles.

After completing a "Fly-by-Wireless" exploratory review last year, a small group went out for dinner for the usual small talk, but George Studor, NASA flight project engineer, turned the conversation into a challenge to his dinner-mates.

"Why can't we have hundreds, even thousands of stick-on sensors transmitting and compensating for interference, kind of like the cell-phones do?" That's how Sandia National Labs and Invocon, Inc. of Conroe, Texas, came together to propose the Micro-miniature Surface Acoustic Wave (SAW)-based Wireless Instrumentation System (Micro-SWIS) project with Studor and recently received a three-year Cross-Enterprise NASA Research Announcement.

Micro-SWIS is a next generation of extremely low-power stand-alone sensor devices that can save hundreds, even thousands of pounds of wire-related weight and cost for instrumentation on station, shuttle and upgraded shuttle, and much more on future vehicles.

Each sensor wire run requires weight, engineering and logistics not only for the wire, but more significantly, for every part of the vehicle the wire passes through. The space shuttle stripped 7,000 lbs. off its avionics weight years ago when it was decided to go to digital fly-by-wire. Now Studor and his team hope that experience with add-on instrumentation payoffs on existing vehicles will lead to designing in wireless networks into the vehicle core systems/instrumentation from the start - saving even more.

Wireless instrumentation reduces on-orbit crew time and cost for retrofitting ISS or shuttle with additional wiring for measuring the parameters to validate the engineering models, the actual structural/system health, and monitoring real-time conditions such as temperature, pressure, acoustic noise, and crew health.

On STS-97/ISS 4A, the Wireless Instrumentation Systems (WIS) and Micro-WIS systems are providing real-time temperature monitoring during assembly operations of the Z1 and P6 segments, temperature recordings of various orbiter structural compartments in preparation for future modifications, acceleration and strain in the Node, and even a wireless command/data link to the Floating Potential Probe. Other wireless systems are multiplying: the Wireless Video System for the EVA crewmember and the wireless Local Area Network (LAN) for the on-board laptops.

Both the WIS and the Micro-WIS projects have grown out of successful Phase 2 and 3 Small Business Innovative Research programs. Measuring as small as 1" x 1" x 1/2" and weighing only 2 ounces, Micro-WIS units can be placed almost anywhere on the space

shuttles or other space hardware to measure acceleration, strain, pressure or temperature and store or transmit the data.

"We wouldn't be where we are without a lot of support and guys like John Saiz, also of JSC's Structures and Thermal Division who handles the wireless temperature measurements

and has been a great project leader for both development and on-orbit tests," said Studor. "Our goal is to help the JSC Engineering structures and thermal team get the data when and where they need it. We were challenged

with how can we get more units out there for the structural and thermal tests. To replace existing systems we will need hundreds of sensors like accelerometers and strain gauges, operating on very low power, and all time-synchronized. We cannot afford to let today's wireless limitations keep us from attacking the problem positively with all the great minds available out there."

Micro-miniature wireless instrumentation units, such as the prototype shown here by George Studor, may help engineers reduce weight on space vehicles.

NASA JSC Photos
2000e27974 and
2000e24976 by Bill Stafford



Albuquerque's lead for cooperative ventures with NASA, responded to the news with enthusiasm and commitment.

"In fact," says Blewer, "since we submitted the proposal with NASA last year, we have had several other projects start that are developing related technologies."

Karl Kiefer, Invocon's president, has not been waiting either, dedicating a significant portion of its in-house R&D. "We kept our research going even when we felt the proposal had been rejected because we know this is where instrumentation technology has got to go."

According to Studor, these applications are merely the tip of the iceberg on what programmable SAW-based wireless transmitters are capable of. In fact, he believes the SAW technology itself will result in a whole new family of very low power sensors. He cites not only the possibilities in the space industry, but in a wide range of markets from aircraft and military, to automotive and home monitoring and controls.

"Figuring out all the various ways this technology could be used is still a fascinating challenge, but right now this gives us a chance to replace many of the wires used for instrumentation, data and commanding." said Studor. "We can't use wireless for everything we want at this point. That would be cost prohibitive and too risky, but this new NRA does give NASA a chance to optimize the mix of wireless and other new technologies in what we are starting to call 'fly-by-wireless.'" ■

PEOPLE on the **MOVE****Human Resources reports the following personnel changes:****Additions to the Workforce**

Ann Whitener joins the Human Resources Management Branch, Human Resources Office, as a human resources representative.

Louis Cancino joins the Command, Control/Planning Systems Development Branch, Advanced Operation/Development Division, Mission Operations Directorate, as a computer engineer.

David Swartwout joins the Laptop Production and Development Branch, Flight Avionics Division, Mission Operations Directorate, as a computer engineer.

James Duncan and *Stephen Hart* join the Medical Operations Branch, Medical Sciences Division, Space and Life Sciences Directorate, as medical officers.

Promotions

Sharon Evans was selected as a student programs specialist in the Education and Student Programs Branch, Human Resources Office.

Sharon Williams was selected as the secretary for the Biomedical Hardware Development and Engineering Office, Engineering Directorate.

Reassignments to Other Directorates

John Fields moves from the Safety, Reliability, and Quality Assurance Office to the Mission Operations Directorate.

Barry Boswell moves from the International Space Station Program to the Engineering Directorate.

Terry Gobert moves from the Mission Operations Directorate to the Safety, Reliability, and Quality Assurance Office.

Retirements

Herbert Noakes of the Safety, Reliability, and Quality Assurance Office.

Travis Brice of the International Space Station Program.

Resignations

Hal Aldridge of the Engineering Directorate.

Sharon Halprin of the Information Systems Directorate.

Scott Schoenherr of the EVA Project Office.

NASA BRIEFS**NASA'S CHANDRA CAPTURES TELLING GAMMA-RAY AFTERGLOW**

The Chandra Observatory's sharp-eyed X-ray vision has detected something never before seen. The discovery may help find the origin of what many researchers believe are the most powerful explosions in the universe.

The clues are found in the afterglow of a gamma-ray burst (GRB), and could strengthen the case for a "hypernova" model, where massive collapsed stars generate these mysterious blasts of high-energy radiation.

An international team of scientists used Chandra to observe iron emission lines from ejected material surrounding one such burst known as GRB991216. This is the first time emission lines associated with GRBs have been unambiguously detected and their properties precisely measured at X-ray wavelengths.

"The discovery of iron lines in the X-ray spectrum is an important clue to our understanding of GRBs," said Luigi Piro, lead author of the paper that appears in the journal *Science*. "Studying the immediate area around the GRB tells us a great deal about the origin of the GRB itself."

Astronomers have long debated how GRBs originate. One theory contends that GRBs result when two "compact objects," that is, neutron stars or black holes, collide and coalesce. Another theory speculates that a "hypernova," a gigantic star collapsing on itself under its own weight, could cause these extremely energetic outbursts.

A shift in the wavelength, or energy, of the detected iron line emission, relative to what would be seen in a laboratory, tells researchers the distance to the GRB. The Chandra team determined it has taken six billion years for the X-rays from GRB991216 to reach Earth.

From the distance and the intensities of the detected X-ray emission lines, the investigators deduced the properties of the ejected material and its relationship to the GRB. The team was able to determine the mass of the medium within a light day or two of the GRB as approximately equivalent to at least one-tenth that of the Sun. By analyzing the widths of the detected spectral lines, the researchers found that the material surrounding GRB991216 is moving away nearly 10 percent the speed of light.

"Our data helps rule out the scenario where two neutron stars or black holes collide," Piro said. "We think GRBs result from something similar to a supernova explosion, but much more powerful."

Scientists speculate that the initial shedding of material, perhaps the outer envelope of a hypernova, is followed by an event at the core of that hypernova – most likely a collapse to a black hole. Energy released by the fireball of the resulting GRB would then heat up the ejected material, producing optical and X-ray afterglows, lasting days or weeks.

HUBBLE SEES LONE NEUTRON STAR STREAKING ACROSS GALAXY

Several hundred million of them may be found in our galaxy, but the world's most powerful telescope has captured the one thought to be closest to Earth. NASA's Hubble Space Telescope has caught up with a runaway neutron star believed to be 200 light years away.

The object known as RX J185635-3754 is expected to swing by the planet at a safe distance in about 300,000 years. A neutron star is the remnants left behind after a supernova explosion, as the material at the core collapses into a dense mass of neutrons. The star has the mass of the sun packed into an area about 12 miles in diameter.

Precise observations made with the Hubble telescope confirm the isolated interstellar traveler is now located in the southern constellation Corona Australis. Since the object has no companion star that would affect its appearance, this discovery will allow future astronomers to more easily confirm stellar theories against a variety of its physical properties such as size, inherent brightness and true age.

DATES & DATA**December 1**

Chess Club Meets: The Space City Chess Club meets each Friday from 5:30 p.m. - 9 p.m. at the Clear Lake United Methodist Church, 16335 El Camino Real, room 423. All skill levels are welcome. For more information, please call James Mulberry at x39287 or James Termini at x32639.

December 4

NSS meets: The Clear Lake area chapter of the National Space Society meets at 6:30 p.m. at the Parker Williams Branch of the Harris Co. Library at 10851 Scarsdale Blvd. For more information contact Murray Clark at (281) 367-2227.

December 5

Quality Society meets: The Bay Area Section of the American Society for Quality meets at 6 p.m. at Franco's Italian Restaurant. For details contact Ann Dorris at x38620.

December 6

Astronomy seminar: The JSC Astronomy Seminar Club will meet at noon December 6, 13 and 20 in Bldg. 31, Rm. 248A. For more information contact Al Jackson at x35037.

Spaceteam Toastmasters meet: The Spaceteam Toastmasters meet at 11:30 a.m. December 6, 13 and 20 at United Space Alliance, 600 Gemini. For more information contact Patricia Blackwell at (281) 280-6863.

December 7

Communicators meet: The Clear Lake Communicators, a Toastmasters International club, meets December 7, 14 and 21 at 11:30 at Wyle Laboratories, 1100 Hercules, Suite 305. For more information contact Allen Prescott at (281) 282-3281 or Richard Lehman at (281) 280-6557.

Warning System Test: The site-wide Employee Warning System performs its monthly audio test at noon. For more information contact Bob Gaffney at x34249.

December 8

Astronomers meet: The JSC Astronomical Society meets at 7:30 p.m. at Space Center Houston. For more information contact Chuck Shaw at x35416.

December 12

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

IAAP meets: The Clear Lake/NASA Chapter of the International Association of Administrative Professionals meets at 5:30 p.m. in the Colonial Room at Grace Community Church, 14325 Crescent Landing. Cost is \$12.

NPMA meets: The National Property Management Association meets at 11:30 a.m. at the Gilruth Center. For more information contact Ray Whitaker at (281) 212-6030.

December 13

MAES meets: The Society of Mexican-American Engineers and Scientists meets at 11:30 a.m. in Bldg. 16, Rm. 111. For more information contact Laurie Carrillo at (281) 244-5203.

December 14

Airplane club meets: The Radio Control Airplane Club meets at 7 p.m. at the Clear Lake Park building. For more information contact Bill Langdoc at x35970.

JSC Holiday Extravaganza and 'Toys for Tots' coming in December

Celebration of the holiday season at JSC, with a "Toys for Tots" collection, is tentatively scheduled from 11:30 a.m. to 12:30 p.m. daily from December 1-20 in the Bldg. 3 cafeteria.

The U.S. Marine Corps "Toys for Tots" program kickoff date will be determined. This program makes holiday wishes come true for needy children. Barrels will be placed in the Bldg. 3 cafeteria to receive toy donations to show our support of such a worthwhile endeavor.

As part of the JSC Holiday Extravaganza, music and entertainment for the holiday season will be performed each day by such

groups as For The Lord, J. Frank Dobie High School's JFD Chamber Choir, Sheldon Intermediate Choir, Forest Brook Choir, JSC Child Care Center, Clear Lake High School "Soundwaves," Sterling High School "Silvertone," JSC FMD Singers, and SR&QA Carolers, just to name a few.

All employees are encouraged to attend these performances and express our appreciation to these entertainers who have graciously agreed to come share their musical talents with us! Look for more information, such as flyers and table tents in the cafeterias, as we get closer to the event. ■

SPACE CENTER Roundup

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