

# Space News Roundup

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No. 16

## STS-59 crew will discuss its mission

The STS-59 crew will brief JSC employees on its recently-completed Space Radar Laboratory Mission at a 1 p.m. presentation May 5 at Teague Auditorium.

Immediately before the briefing, the six crew members—Commander Sid Gutierrez, Pilot Kevin Chilton, Payload Commander Linda Godwin, and Mission Specialists Tom Jones, Jay Apt and Rich Clifford—will receive their Space Flight Medals.

The crew also is scheduled to discuss the mission with guests at Space Center Houston beginning at 11 a.m. May 6.

JSC employees will be admitted to the briefing at Space Center Houston free of charge by showing their NASA badges at the entry turnstile.

Employees driving to that presentation should show their NASA badges to park free of charge.



NASA Photo

**MISSION ENDS**—On board *Endeavour*, Mission Specialists Rich Clifford, Tom Jones and Jay Apt bid goodnight to flight controllers. The mission ended Wednesday with a landing at Edwards Air Force Base, California.

## Images show a changing Earth

By James Hartsfield

*Endeavour* landed Wednesday in California following 11 near-perfect days in orbit on shuttle mission STS-59, a mission that gathered radar images of the Earth's topography, environment, geology and oceanography.

Flight controllers were prepared for *Endeavour* to return to either Florida or California, after having added two extra days to the planned nine-day mission. One day was added to allow additional radar images to be gathered while another day was added when weather at Kennedy Space Center on Tuesday proved unfavorable for a landing there.

Poor weather conditions at KSC Wednesday prompted flight controllers to select Edwards Air Force Base for landing.



The Space Radar Lab-1 instruments aboard *Endeavour*—the Shuttle Imaging Radar-C, the X-Band Synthetic Aperture Radar and the Measurement of Air Pollution from Satellites—worked flawlessly during their first trip to orbit.

By late Monday, the instruments had mapped more than 70 million square kilometers of the Earth during the preceding 10 days, and the SIR-C instrument was powered on to gather even more images during

Please see SRL, Page 4

## Hubble Space Telescope teams to receive honor awards

More than 40 individuals and 27 teams will be honored for their contributions to the success of the first Hubble Space Telescope Servicing Mission at awards ceremonies being held throughout May and June.

NASA Honor Awards for STS-61 related contributions honor individuals and groups nominated by JSC to receive NASA's highest honorary awards.

The NASA Outstanding Leadership Medal will be presented to STS-61 Lead Flight Director, Milt Heflin.

NASA Exceptional Achievement Medals will be presented to James Bates, Michele Brekke, Bobby Brown, Ken Cameron, Jeff Carr, Jervy Conwell, Liz Duffy, Ronald Farris, Carolyn Fritz, Lynda Gavin, Michael Gernhardt, Jeffrey Hanley, Greg Harbaugh, Kyle Herring, David Homan, June Huhn, David Jackson, Gary Johnson, Cheever Lambert, Jr., Ralph Marak, Harold McMann, Ronald Newman, William Norfleet, Sam Pool, Steve Poulos, Jr., William Powers, Susan Rainwater, Jerry Ross, Leslie Schaschl, Joseph Stich, Lawrence Turner, and John Young.

The NASA Public Service Medal will be presented to Maxime Faget, Space Industries;

Ralph Jacobson, Charles Stark Draper Laboratories; Herbert Kottler, Massachusetts Institute of Technology; Michael Mott, General Research Corp.; Bradford Parkinson, Stanford University; Joseph Shea, Massachusetts Institute of Technology; Thomas Stafford, Stafford, Burke, and Hecker; and James Thornton, Rockwell International.

NASA Group Achievement Awards will be presented to representatives of the following teams: Electronic Still Camera Project; Electronic Systems Test Laboratory; Flight Crew Equipment Support; Hubble Space Telescope Engineering Drawing; Hubble Space Telescope EVA Training Neutral Buoyancy Simulation; Hubble Space Telescope First Servicing Mission EVA Tools and Support Equipment; Hubble Space Telescope Mission Director's Office; Hubble Space Telescope Mission Printing; Hubble Space Telescope Repair Mission EVA Communications; Hubble Space Telescope Repair Mission's Virtual Reality Astronaut Trainer Development; Hubble Space Telescope RMS Mission Support

Group; Hubble Space Telescope Servicing Mission Mockup and Integration Laboratory Training Support; Hubble Space Telescope Servicing Mission-One Integration; Hubble Space Telescope Virtual Reality Training Systems Development; JSC Nitrox Development and Support; JSC Payload Safety Review Panel; JSC Safety Review Team for the MSFC Neutral Buoyancy Simulator Nitrox System; Ku-band Radar; Medical Operations Flight Control; Payload/Cargo Integration; Space Shuttle EMU Thermal Design and Mission Certification; STS-61 Customer Support Room Operations; STS-61 EMU Mission Support; STS-61 Flight Evaluation and Engineering; and the STS-61 Training Team.

The EMU Spacesuit Glove Thermal Protection Team will receive the NASA Public Service Group Achievement Award.

The awards will be presented at six separate ceremonies. The Shuttle Program award ceremony is at 3 p.m. May 4 in Teague Auditorium. Engineering recipients will receive their awards at 2 p.m. May 9 in Rm. 966,

Bldg. 1. The Mission Operations Directorate will present its awards at 3:30 p.m. May 11 at the Gilruth Center. The Flight Crew Operations Directorate awards will be presented at 8 a.m. May 23 in Rm. 6600 in Bldg 4 South.

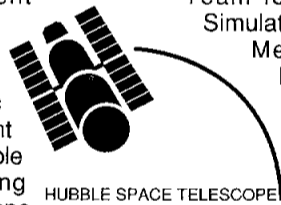
Honorees from Public Affairs, Center Operations, Safety, Reliability and Quality Assurance, Information Systems, the Orbiter Projects office, the Space Station Program Office and non-NASA Public Service Medal recipients will receive their awards at 2:30 p.m. May 25 in Teague Auditorium.

The Space and Life Sciences Directorate will present its awards at 11 a.m. June 6 in Rm. 860, Bldg. 1.

Center Director Dr. Carolyn Huntoon will make the presentations.

Recipients are encouraged to invite both family members and coworkers to attend the ceremonies with them. Supervisors are encouraged to allow JSC civil service and contractor employees to attend as workloads permit.

For additional information, contact the nominating organization's administrative officer or Helen Harris at x38413.



## Flight manifest reflects space station activity

NASA's Mixed Fleet Manifest reflecting flight rates for space shuttle/space station mission through 1997 and expendable launch vehicle missions through 2001 was released by Headquarters on April 18.

Included in the space shuttle/space station portion of the manifest are 10 shuttle flights to the Russian Mir space station. These flights, between 1995 and 1997, represent the first of three phases of international space station cooperative activities.

Launch of the first Spacelab-Mir mission is scheduled for May 1995.

The manifest update also includes reflight of the Tethered Satellite System in March 1996.

The next Hubble Space Telescope Servicing Mission, is slated to fly on board *Endeavour* in August 1997. The first U.S. element launch of the international space station is scheduled for December 1997 also on board *Endeavour*.

The manifest also reflects the recently-announced Orbiter Maintenance Down Period that will allow the modification and refurbishment of the

shuttle fleet.

The commercial, expendable launch vehicle fleet continues to provide NASA with reliable and efficient access to space for a variety of payloads supporting space science missions.

On May 16 NASA is scheduled to launch its last Scout rocket from Vandenberg Air Force Base, Calif. The Scout launch, NASA's 118th over a 34-year period, will carry a Department of Defense payload into polar orbit.

The first NASA flight of the Pegasus rocket, carrying the Total Ozone Mapping Spectrometer, is scheduled for June 22. The final NASA launch of the Atlas-E Expendable Launch Vehicle will be Sept. 29, carrying the NOAA-J satellite.

The first west coast launch of a Delta-II ELV will be NASA's Polar mission. The mission originally was scheduled to occur later this year but the launch date currently is being reviewed. The first west coast launch of the new Atlas IIAS vehicle is scheduled for June 1998, carrying the EOS-AM-1 satellite to orbit.



**SMALL BUSINESS HONORS**—Gene Easley, Director of Procurement, and Bob Dupstadt, Small Business Specialist, present Shari Miller and Sylvia Aragon with awards for their contracting efforts with Small Businesses.

## JSC employees are recognized

Two JSC employees recently were honored for their efforts in awarding contracts to small businesses.

Sylvia Aragon was recognized as the JSC buyer whose cooperative efforts resulted in the largest number of new awards to small businesses by a single buyer. Shari Miller received the award for having the largest dollar volume of new awards granted to small business during fiscal year 1993.

President Clinton has proclaimed the week beginning May 1 as "Small Business Week."

More than 20 million small businesses employ half of the country's work force and two of every three new jobs are created by these small businesses.

"Since its inception, NASA has recognized the potential of the small business community," said Small Business Specialist Bob Dupstadt. "During fiscal year 1993, JSC placed more than \$159 million with small business firms."

According to Dupstadt, that amount set a record for JSC.





# SRL transmits pictures of Earth home

**D**uring STS-59, the Space Radar Laboratory used its unique tools to give researchers images that may provide clues to the Earth's history and a glance toward its future.

Clockwise from top left:

1. This three-dimensional view of Isabela, an island in the Galapagos chain, shows a detailed view of two of the six volcanoes located on the island. The Spaceborne Imaging Radar C/X-band Synthetic Aperture Radar image was laid over a digital elevation map to show the Alcedo and Sierra Negra volcanoes. The vertical scale is exaggerated by a factor of 1.87 to help scientists detect relationships between the faults and fractures and the surrounding topography.

2. The island of Isabela, with a small portion of Isla Fernandina visible in the upper left corner of the image, has six active volcanoes similar to the type found in Hawaii. The Galapagos Islands were one of the SIR-C/X-SAR supersites and images of this area were taken several times during the STS-59 mission. Scientists will conduct topographic change studies and search for different lava flow types, ash deposits and fault lines. Since Charles Darwin first visited the Galapagos in 1835, there have been more than 60 recorded eruptions of these volcanoes.

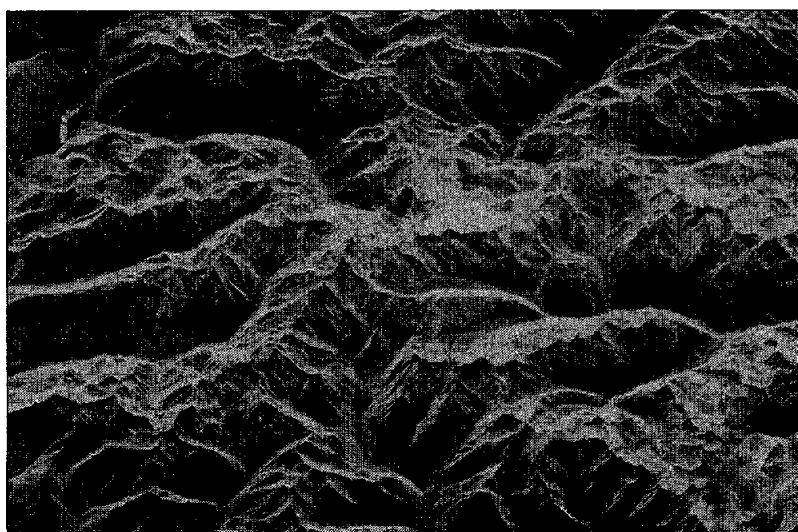
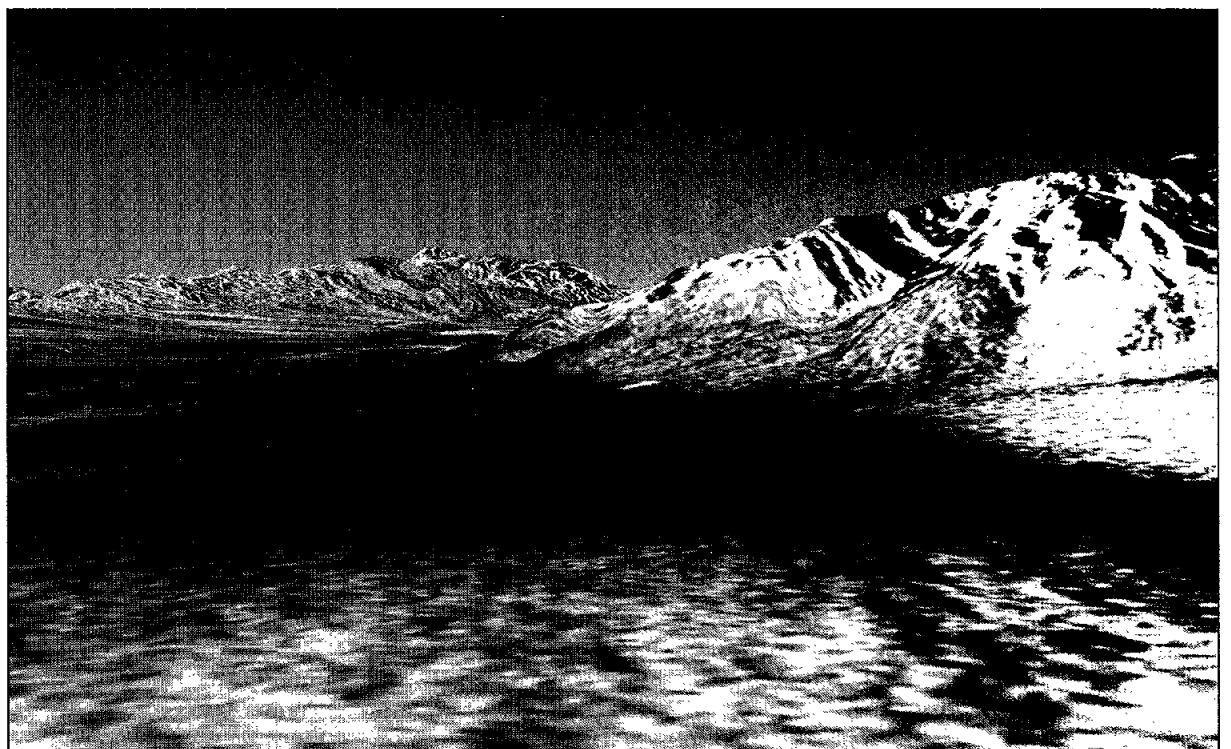
3. Mount Pinatubo in the Philippines, erupted in June 1991 leaving behind vivid scars on the Earth's surface. The main volcanic crater and steep slopes on the upper flanks of the volcano were created during that eruption. The SIR-C/X-SAR image also reflects the smooth mud flows which continue to flood surrounding river valleys following heavy rains. Images like this one will be used to identify the areas flooded by the mud flows and to assess the rate at which the erosion and deposition continue.

During the second SIR-C/X-SAR mission in August, additional images of Mount Pinatubo will be taken to evaluate short-term changes in the areas as new mud flows occur during the summer monsoon season. The

mud flows are expected to pose a severe hazard in the Mount Pinatubo area for the next 10 to 15 years. The 1991 eruption had near-global effects on the atmosphere and climate due to the large amounts of sulfur dioxide injected into the upper atmosphere.

4. Death Valley, Calif. was another supersite targeted for extensive observation with SIR-C/X-SAR. Elevations in the valley range from 230 feet below sea level, the lowest in the United States, to 10,800 feet above sea level. Scientists will use these images to answer a number of questions about the Earth's geology, including how alluvial fans, seen as fan-shaped areas extending from the mountains to the valley floor, are formed and how they change through time and under the influence of climatic change and earthquakes. Alluvial fans are gravel deposits that wash down from mountains and are built up through climatic and tectonic processes. Information gained from this study will help scientists understand the nature and rates of weathering processes on the fans, soil formation and transport of sand and dust by the wind. The goal of these studies is to gain a better understanding of the record of past climatic changes and the effects of those changes on Earth's sensitive environment. Scientists hope this will increase their ability to predict future response of the land to different potential global climate-change scenarios.

5. The glacier Gepatschferner, located in the Central Alps of Austria, is seen by SIR-C/X-SAR as a triangular patch in the center of the image. This area was a hydrology supersite for the imaging equipment on board *Endeavour*. Almost one quarter of the area surveyed is covered by glaciers. The tongues of the glaciers are descending from elevated plateaus into narrow valleys that were formed during the last ice age. Researchers are interested in this area of Austria since an understanding of how glaciers shrink and grow over time is an important indication of climatic change. □



# Computer Expo '94 will showcase new technologies

The Information Systems Directorate will host Computer Expo '94 beginning at 8 a.m. May 4 at the Gilruth Center.

The event features over 40 exhibits and includes a number of seminars and demonstrations of the latest computer technology. Seminars will be held throughout the day in Rms. 204 and 206. In Rm. 204, the first seminar, GTSI Uniting Government with Technology, begins at 8:30 a.m. Other scheduled seminars include AutoCAD Release 12, AutoCAD LT for Windows, 3-D Studio Designer from 10-

11 a.m.; Power Macintosh: Strategies and Direction in RISC Systems Processing from 11:30 a.m.-12:30 p.m.; DCA's Remote LAN Node (RLN) product will be shown for LAN dialup access to database emulation and other applications from 1-2 p.m. and 2:30-3:30 p.m.; and Apple Computer Federal Systems will discuss Integrating AV Technologies into Mainstream Applications Systems from 3:30-4:30 p.m.

Beginning at 8:30 a.m. in Rm. 206, Intergraph Corp. will present Technical Desktop Series, Micro-

Station, ModelView. Other presentations include Harvard Graphics for Windows 2.0 from 10-11 a.m.; ClarisImpact for Business Graphics and Reports; ClarisDraw, a Next Generation McDraw with 'Intelligence' from 11:30 a.m.-12:30 p.m.; FOCUS and Enterprise DATA Access/SQL (EDA/SQL) from 1-2 p.m.; Managing Projects with Artemis Systems from 2:30-3:30; and GTSI Uniting Government with Technology from 3:30-4:30 p.m.

Featured exhibitors at the all-day event include: Apple Computer Federal Systems; AutoDesk, Inc;

Auto Tester, Inc; Cisco Systems; Claris Corp.; Commit Inc.; Compu-Add; Compu-Data; Concurrent Computer Corp; CRAY Research Inc.; Data Projections, Inc.; DCA; Digital Equipment Corp.; Egghead Software; Flacon Microsystems; Government Technology Services, Inc.; Harris Computer Systems Division; Hewlett-Packard Company; IBM Federal Systems; IMT Systems; Information Builders, Inc.; I-NET, Inc.; Keatron Software Corp.; Intergraph Corp.; Lucas Management Systems; Memorex Telex Corporation; McBride and

Associates, Inc; NEC Technologies, Inc.; Oracle Corp; Prentice Hall Software Publishing; Raynor Computer Service, Inc.; Silicon Graphics; SOFTWARE AG Federal Systems Inc.; Software Publishing Group; Software Spectrum; Sun Microsystems; UNISYS Government Services, Inc.; and ZEH Graphic Systems, Inc.

Computer Expo '94 is sponsored jointly by ISD and the University of Houston-Clear Lake/RICIS.

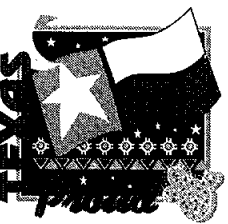
For additional information, contact the ISD Products Center at x37575.

## Picnic committee mounts search for competitors

The JSC Picnic Committee is looking for a few hardy folks to participate in the "Almost Anything Goes" competition at the May 7 "Texas Proud" picnic.

The Picnic Committee needs 4 to 6 teams for the competition which typically includes several different relay or timed competitions among the teams. This year's event is set to begin at 2:30 p.m. and each team should consist of three women and three men.

There is no cost for the teams to enter the competition, however, team



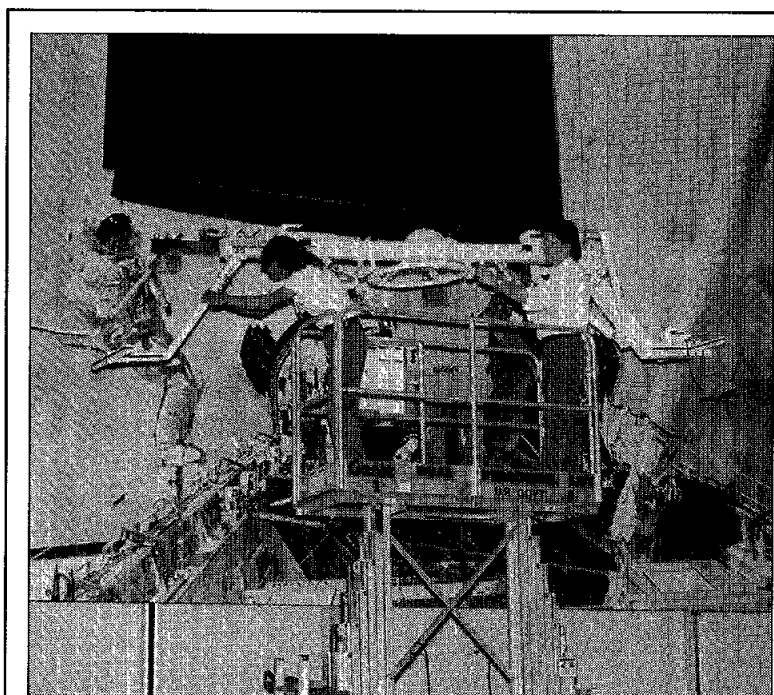
members must purchase picnic tickets to be able to enter the picnic grounds. Teams must pre-register at the Gilruth Center by May 6.

Trophies will be awarded to each member of the first, second and third place teams. For information on the "Almost Anything Goes" competition, contact Robert Dunlap, x33861.

This year's picnic, which will run from 11 a.m. to 5 p.m., will include music by 4th Wave Rhythm, carnival rides and games, a petting zoo, a magician, face painters, a dunk tank, video games, bingo, astronaut autographs, popcorn, snow cones, cotton candy, ice cream and a barbecue dinner.

Tickets for the picnic are on sale at the Bldg. 11 Exchange Store. Until April 29, the prices are \$5 for adults and \$3 for children.

After April 29, the prices increase by \$1.



**GETTING A GRIP ON HISTORY** — Curly Phillips and Larry Friend mount the Intelsat capture bar in front of a mural of the satellite inside the lobby of Teague Auditorium. Shuttle astronaut Pierre Thuot tried to grasp Intelsat with the capture bar during STS-49, the mission to repair the ailing satellite in May, 1992. Eventually three space-walking astronauts grabbed the satellite by hand and stowed it safely in *Endeavour's* cargo bay for repair.

JSC Photo by Bob Walck

## Used baby items for sale

The JSC child care center will hold its semi-annual used clothing and baby items sale on April 30.

The sale runs from 8 a.m.-noon in front of the child care center. Items for sale will include used baby clothing, maternity clothes, toys and other baby items donated by the families whose children are cared for at the center. Proceeds from the sale are shared equally between the child care center and the families donating the goods.

Any JSC employee wishing to donate good, clean items for the sale can bring them by the child care center until the morning of April 30. One hundred percent of the proceeds from the sale of items donated by employees whose children are not cared for at the center, will go to the child care center.

For additional information on the sale, or to donate items, contact Julie Kliesing at the child care center, x31540.

## Blood pressure checks to be offered by clinic

By Eileen Hawley

JSC's Total Health program will conduct blood pressure screenings beginning May 9 as part of a campaign to make JSC employees aware of the dangers of high blood pressure.

"The only way to find out if you have high blood pressure is through a blood pressure screening," said Mona White of the JSC Clinic. Left untreated, high blood pressure can lead to stroke, and kidney or heart failure.

Although the exact cause of high blood pressure is unknown, certain contributing factors have been identified. People who are overweight, inactive or heavy drinkers, have diabetes or kidney disease, take oral contraceptives or are pregnant are at an increased risk for high blood pressure.

Blood pressure screenings will be held from May 9 - 13 throughout the JSC campus. Employees are encouraged to take advantage of these screenings since most people with

high blood pressure do not show symptoms of the disease.

On May 9, blood pressure screenings will be conducted from 8:30-11:30 a.m. in Bldg. 1; from 1-2 p.m. in Bldg. 7A and from 2:30-3:30 p.m. in Bldg. 32. On May 10, screenings will be held from 8:30 a.m.-noon in Bldg. 30; from 1-2:30 p.m. in Bldg. 16; and from 3-4 p.m. in Bldg. 31.

Screenings continue May 11 from 8:30-11:30 a.m. in Bldg. 45; from 1-2 p.m. in Bldg. 44; and from 2:30-4 p.m. in Bldg. 325. On May 12 screenings will be conducted from 8:30-10 a.m. in Bldg. 419; from 10:30-11:30 in Bldg. 273 at Ellington Field; from 1-2 p.m. at Bldg. 15; and from 2:30-4 p.m. in Bldg. 4 South.

Daily screenings will be conducted from 10 a.m.-noon and 2-4 p.m. in Bldg. 8.

For information on the blood pressure screenings or to discuss how to prevent or control high blood pressure, contact the clinic at x37783.



total health

## Space News Roundup

The Roundup is an official publication of the National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Texas, and is published every Friday by the Public Affairs Office for all space center employees.

## Workshops set

JSC's Education Branch once again will host its summer aerospace education workshop for teachers.

Enrollment in the program is limited to 30 elementary school teachers who are spouses of JSC employees. The classes will be offered from 8:30 a.m.-5 p.m. daily July 18 through 22.

Applications must be submitted by April 29. For additional information on the summer workshops contact Norma Rhoads, x30235.

# SRL instruments show 'larger picture' of Earth

(Continued from Page 1)

the extra day in orbit given to *Endeavour* Tuesday.

In all, the SRL-1 instruments imaged more than 12 percent of Earth's surface, including more than one quarter of the Earth's land surfaces. Although the majority of radar information was stored aboard *Endeavour* on more than 150 recorded data tapes, scientists were ecstatic over the glimpse of data received on the ground.

Among the images were maps of long-buried ancient rivers that showed the Sahara desert was once a very wet region and a composite map of the distribution of carbon monoxide throughout the atmosphere. The map of carbon monox-

ide is useful to scientists tracking the amount of "greenhouse gases," chemicals that could lead to a general warming of the planet, in the atmosphere.

The radar images are complimented by some 14,000 still photographs taken by the STS-59 crew—Commander Sid Gutierrez, Pilot Kevin Chilton, Payload Commander Linda Godwin and Mission Specialists Jay Apt, Rich Clifford and Tom Jones. The crew worked in two 12-hour shifts to provide around the clock coverage of the radar observations, reporting observed conditions at many of the imaging sites in addition to photographing the areas. In addition, *Endeavour* performed more than 450 maneuvers to assist with

pointing the cargo bay instruments at their targets, more maneuvers than performed during any previous shuttle mission.

Sunday, Jones displayed an ancient hand ax found in the Sahara near a river bed discovered by an earlier version of radar flown aboard a shuttle flight, comparing the ax and its uses to *Endeavour's* mission. "A characteristic of the human race is that they use the tools they create to make a better life for themselves," Jones said. "We're doing the same thing now. With the technology aboard the shuttle, we're using the best tools we have available to improve our life and our society."

"We can see the effects that people have on the Earth, and some of

those signs are very beautiful, such as the city lights we see at night," Jones added. "But some of them are more destructive signs, such as areas of cleared forest, smoke from fires burning in various parts of the globe and air pollution around some cities. We as individuals can't quantify that, but radar images and studies such as this can provide a larger picture of the Earth."

The mission's flawless progression also allowed scientists to schedule several previously unplanned images with the radar, including recent flooding in the United States' midwest and a tropical cyclone in Indonesia. The amount of data gathered on this flight and stored aboard *Endeavour* is equivalent to about

20,000 encyclopedia volumes, scientists said.

*Endeavour's* performance on the mission was essentially flawless, with the only problem cited by the crew a nuisance of water bubbles in the galley water supply, a problem that was corrected late in the mission. The radar lab instruments also performed flawlessly, after a brief few hours of troubleshooting when they were first powered on.

The SRL instruments will fly aboard *Endeavour* again on its next mission, STS-68, currently planned for a mid-August launch. The summer mission of SRL will provide views of similar areas imaged on STS-59, showing them in a different season of the year.

## Children can enjoy summer day camps at Space Center Houston

Space Center Houston will host six day camps for children ages 8 to 12 this summer emphasizing space-related topics such as rocketry, the space shuttle, living on the moon and astronaut training.

The first camp to be offered will be "Rocket 'Engine'uity." During this all-day event children will explore the laws of physics through rocketry activities. They will investigate the aerodynamics of launch vehicles while building a rocket to launch from JSC's Rocket Park. This session will be offered from 8:30 a.m.-3:30 p.m. June 13, 20 and 27, July 25, and Aug. 1.

Other planned sessions include "Lunar

Living," where children will gather information about living on the moon for a number of months and build a lunar base using LEGO blocks. This one-day camp runs from 8:30 a.m.-3:30 p.m. and is offered June 15, 22 and 29, July 27 and Aug. 3.

"Suitable Attire," a half-day camp, will have children trying on a spacesuit and viewing spacesuits worn by astronauts. Camp attendees also will learn how astronauts train for missions. "Suitable Attire" will be conducted from 12:30-3:30 p.m. June 23 and 30, and Aug. 4.

Children will learn about the space shuttle and explore Space Center Houston's shuttle mockup from end-to-end during "Shuttle Orientation" camp. The campers also will build an experimental glider and watch the large-format movie "To Be An Astronaut." This camp runs from 8:30 a.m.-3:30 p.m. on June 14, 21 and 28, July 26 and Aug. 2.

Participants in "Eating Out ...Waaay Out" will have an opportunity to taste-test the foods astronauts eat on orbit. The half-day session runs from 12:30-3:30 p.m. June 23

and 30, and Aug. 4.

Finally, children will have the chance to design and build an exploratory vehicle using LEGO blocks during the "Exploring with LEGO Bricks" camp. Children may attend this session from 12:30-3:30 p.m. June 16, and July 28 or from 8:30-11:30 a.m. June 23 and Aug. 4.

The summer camp sessions are being offered through Space Center Houston's Educational Programs Department. Cost is \$25 for the half-day camps and \$45 for the full-day events. Registration is by mail only.

For additional information, contact Space Center Houston at 244-2145.

