

Think metric

Next week is National Metric Week, and JSC is still on a path toward metric conversion. Story on Page 3.



Plane savers

Five Ellington Field workers get commendations for putting out a fire that endangered NASA 2. Story on Page 4.

Space News Roundup

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Italian gets nod to fly on STS-46

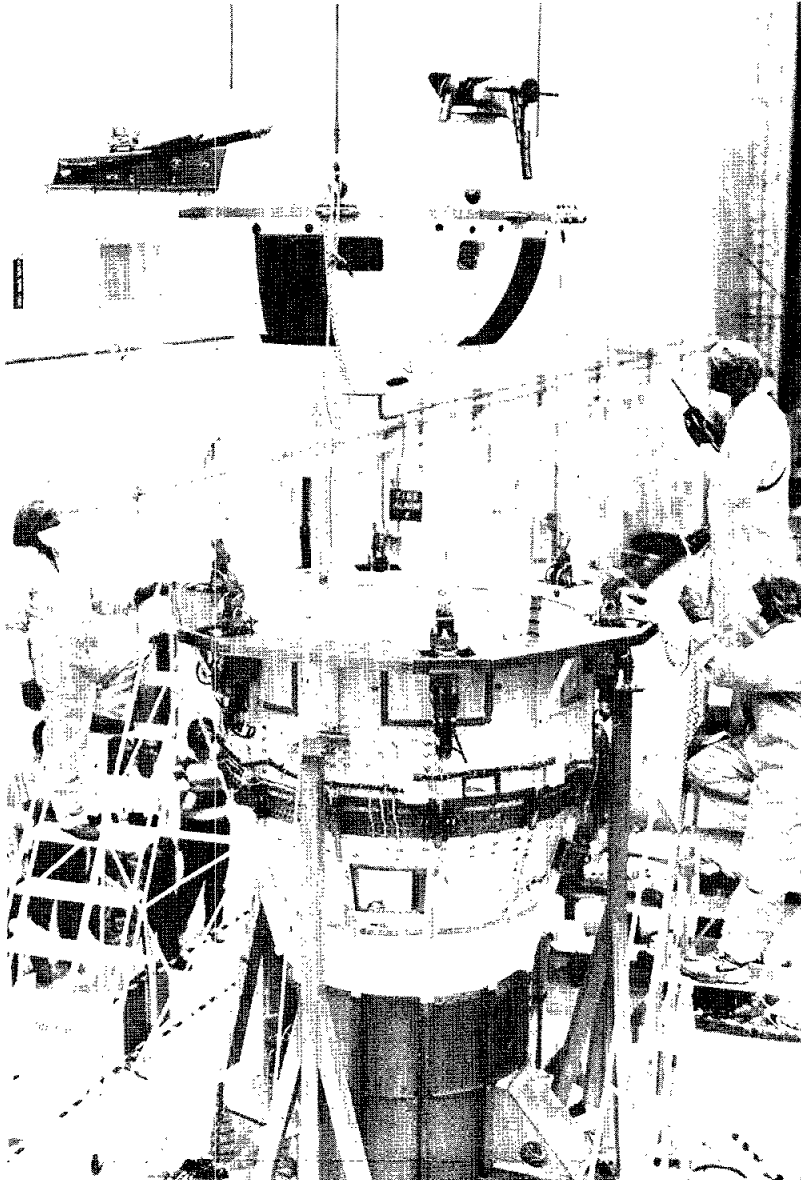
Dr. Franco Malerba has been named prime payload specialist for the Tethered Satellite System-1 mission scheduled for flight aboard STS-46 next fall. Malerba will be the first Italian citizen to fly in space.

Dr. Umberto Guidoni was named backup payload specialist for the cooperative mission between NASA and Italy's space agency, Agenzia Spaziale Italiana.

Malerba will work with the mission specialists in operating TSS-1, and carry out other TSS-1 science investigations during the seven-day *Atlantis* mission. He was born in Genoa, Italy, in 1946, and obtained his doctorate in physics at the University of Genoa in 1974. He joined ASI in 1989.

Guidoni will be ready to participate in the TSS-1 flight as prime payload specialist if Malerba is unable to fulfill his duties. During the mission he will serve in a key science team role at Marshall Space Flight Center. He was born in Rome in 1954 and obtained his doctorate in physics at the University of Rome in 1978. Since 1984 he has been involved with the TSS program as a co-investigator of one of the Italian experiments.

TSS-1 consists of a satellite attached to *Atlantis* by a conducting cable, or tether, which is wound on a motorized reel assembly in the shuttle's payload bay. The ASI is developing the satellite and NASA is developing the deployer mechanism. Both are developing the scientific complement.



NASA Photo

Technicians check the fit of the Tethered Satellite System-1 at Kennedy Space Center. The spherical satellite will be reeled out of its deployer seat and extended on a 12-mile-long tether above the shuttle's orbit during the STS-46 mission now scheduled for September 1992.

Congress gives OK to \$14-billion NASA budget

The House and Senate Wednesday agreed to appropriate \$14.3 billion for NASA in fiscal year 1992, including \$2 billion for Space Station *Freedom*.

NASA Administrator Richard Truly voiced mixed feelings about the compromise, which still must be signed by President Bush before it becomes law, and JSC Comptroller Wayne Draper said it will require substantial belt-tightening at JSC.

"Yesterday's action of the House/Senate Conference on the FY 1992 NASA appropriation leaves the people of NASA with mixed feelings," Truly said following last week's conference committee agreement. "On the one hand, we are tremendously grateful to those many members on both sides of the aisle who have worked so hard on our behalf in this extremely difficult environment and are particularly pleased with the funding for Space Station *Freedom* and the very significant percentage increase for space science. Nevertheless, we are disappointed that, for the first time in many years, the total NASA appropriation does not keep up with inflation.

"In any event," he added, "we will be working very hard to continue to

use the dollars available to provide the American people with a world-class civilian space and aeronautics research program."

The conference committee's markup provides NASA \$6.4 billion for research and development (which includes Space Station *Freedom*), \$5.2 billion for space flight, control and data communications, \$525 million for construction of facilities, \$2.2 billion for research and program management and \$14.6 million for the Inspector General.

Draper said the agency began the new fiscal year Oct. 1 under a continuing resolution, which will be superseded by the new budget as soon as the President signs the funding package for the Veterans Administration, Housing and Urban Development and Independent Agencies, currently expected to occur before Oct. 10.

"JSC will have to economize in areas such as research and program management and the space shuttle program under the new budget," Draper said, "but even though we have read the conference committee report, a detailed assessment of what the budget means to JSC won't be available for several months."

Cracked wing seals on *Atlantis* replaced

By James Hartsfield

Launch preparations for *Atlantis* on STS-44 remain on schedule at Kennedy Space Center, despite added work due to tiny cracks found in several heat-shielding seals between panels on the wings' front edges.

The cracks were found in "Tee-seals" made of reinforced carbon-carbon that serve as expansion joints between large panels made of the same material on the leading edges of the wings. The seals cover the gaps between panels and allow the panels to expand and contract when they are heated or cooled.

Eight of the 44 total seals on *Discovery* — 22 on each wing — were found to have slight cracks, some of which cannot be seen without magnification and special

lighting. Technicians began replacing the cracked seals this week with spare seals and were expected to complete the job by early next week.

Cracked seals also were found on nine seals from *Columbia*, currently in Palmdale, Calif., undergoing a thorough maintenance check and several upgrades.

A check of several strategically located seals on *Discovery* so far has been performed on three seals and has not found any cracks. Eleven more seals are to be inspected on *Discovery*, and engineers are discussing the possibility of checking several seals on *Endeavour* in an attempt to gather more information on how and why the cracks occur.

Please see **TEAM**, Page 4

Curtain rises on cooperation

Sixty organizations review Space Exploration Initiative

More than 60 government and corporate organizations took the first steps of a long journey of cooperation here this week at the first Space Exploration Initiative Technical Interchange Meeting.

The meeting, conceived and organized by JSC's Lunar and Mars Exploration Program Office, was a chance for those interested in the Space Exploration Initiative to begin a dialog with each other, analyze its concepts and air new ideas.

Doug Cooke, acting manager of the Lunar and Mars office, said he was pleased with the turnout, which grew so large that the meeting was moved to the University of Houston-

Clear Lake auditorium.

"There's been some really stimulating discussion," Cooke said. "We've allowed time to discuss issues or ask questions, so there is a significant amount of interchange going on."

"All the industry representatives have been enthusiastic about having this meeting and they think we ought to continue have them," he added. "It's an opportunity to expose our work and let everyone know what we're thinking, and to find out what's going on in the SEI community."

Cooke said industry presenters included Boeing, Lockheed,

Rockwell and Rocketdyne, United Technologies, Honeywell, McDonnell Douglas, Spar Aerospace, TRW, General Dynamics, IBM and many others. Also presenting were representatives of several Department of Defense and Department of Energy laboratories.

Discussion of Synthesis Group report subjects ranged from automation and control to engineering technologies in space and ground data systems and space nuclear power and propulsion systems.

"The overall feeling about the synthesis report is that it's a good Please see **INTERCHANGE**, Page 4

Combined Federal Campaign opens

By Kelly Humphries

JSC kicks off its 21st annual Combined Federal Campaign on Monday, and all employees are invited to help the center achieve its \$385,000 goal.

This year's theme is "The Voice of Hope," referring to those who give.

The CFC is a once-a-year voluntary fund-raising effort that gives JSC employees a chance to contribute to local, national and international health and welfare charities. The campaign will start with a kickoff at 9 a.m. Monday in Bldg. 1, Rm. 966, and runs through Nov. 13.

The total goal for the Houston United Way drive is \$67.7 million, and the CFC goal is \$2.4 million.

Last year, JSC employees contributed \$372,426, or 6 percent more

than the \$350,000 goal.

"We're asking everyone to donate 1 or 2 hours worth of their salary per month again this year," said Teresa Sullivan, JSC's CFC coordinator. "The 1- and 2-hour gifts were significant in helping us reach last year's goal, and we're hoping we can surpass that this year."

Employees who give 1 or 2 hour's pay per month will be eligible to win a drawing for a round-trip airline ticket to anywhere in the continental United States. This year, four employees will receive tickets in the drawing.

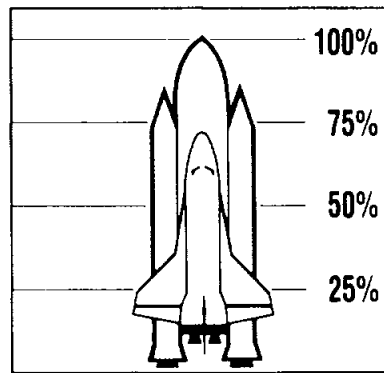
Those who give 1 hour's pay per month also will receive an Eagle pin, and those who give 2 hour's pay will receive an Eagle pin and a coffee cup. Last year, 392 people gave 1 hour's pay, and 58 gave 2 hour's pay.

The CFC supports many worthwhile organizations, including one of special interest to JSC employees — the NASA College Scholarship Fund Inc., which provides educational assistance to selected NASA dependents.

Employees may earmark their contributions for any of the 700 charities.

"I know that JSC personnel care, and it is my sincere hope that you will contribute as liberally as possible to this deserving combined campaign," said JSC Director Aaron Cohen.

Each JSC organization will have a division or office captain responsible for soliciting donations. They will attempt to contact each JSC employee during the campaign. If you are not contacted and would like to begin participating or change your contribution, contact Sullivan at x38970.



1991 GOAL: \$385,000



IBM gets JSC's automated data processing job

By Pam Alloway

JSC has awarded the Operations Automatic Data Processing contract to IBM Federal Sector Division, Houston.

The 13-year contract provides for as many as 48 ground-based mission operations main frame computer systems, peripheral equipment and services.

The contract is a firm-fixed price, indefinite delivery/indefinite quantity contract with a basic eight-year performance period with five additional one-year options.

Please see **CONTRACT**, Page 4

JSC

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Gift Store from 10 a.m.-2 p.m. weekdays.

- General Cinema (valid for one year): \$4.
 AMC Theater (valid until May 1992): \$3.75.
 Loews Theater (valid for one year): \$4.
 Astroworld (valid 1991 season): season, \$44.94; child less than 4-feet, \$10.12; one day, \$15.85; Waterworld, \$8.15.
 Seaworld of Texas (valid 1991 season): child (3-11), \$12.25; adult, \$17.25; (2-day) child \$15.95; adult, \$21.95.
 Six Flags (valid until Nov. 17): adult (1 day) \$13.95.
 Texas Renaissance Festival (9 a.m.-6 p.m. weekends Oct. 5-Nov. 17, Plantersville): child (5-12), \$5.55; adult, \$9.25.
 Renaissance Festival bus trip (7:30 a.m.-5:30 p.m. Oct. 26 or Nov. 9, includes transportation and admission): child, under 5, \$7; child, 5-12 years, \$10; adult, \$15.
 NASA Night at Delta Downs (Nov. 16-17, tickets go on sale Oct. 2). Day trip (3:30 p.m.-2:30 a.m., includes transportation and admission to clubhouse): \$15. Overnight trip (12:30 p.m.-12:30 a.m., includes transportation, reception at Beaumont Hilton, accommodations, admission, brunch): \$50.
 Halloween Dance (7 p.m. Oct. 26, Gilruth Center, music by 4th Wave Rhythm, costumes encouraged, prizes best costumes): \$15, tickets go on sale Oct. 9.

JSC

Gilruth Center News

Sign up policy — All classes and athletic activities are first come, first served. Sign up in person at the Gilruth Center and show a badge or EAA membership card. Classes tend to fill up four weeks in advance. For more information, call x30304.

Defensive driving — Course is offered from 8 a.m.-5 p.m., Nov. 16 or Dec. 14. Cost is \$15.

Aerobic dance — High/low-impact classes meet from 5:15-6:15 p.m. Mondays and Wednesdays or Tuesdays and Thursdays. Cost is \$32.

Exercise — Low-impact class meets from 5:15-6:15 p.m. Monday and Wednesday nights. Cost is \$24.

Weight safety — Required course for employees wishing to use the Gilruth weight room. The next class will be from 8-9:30 p.m. Oct. 17. Cost is \$5; pre-registration required.

Intercenter run — Runners may turn in two-mile and 10-kilometer run times for competition among NASA centers throughout October. Participants must register at the Gilruth.

Fitness program — Health Related Fitness Program includes medical examination screening, 12-week individually prescribed education program. Call Larry Wier, x30301.

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Dates & Data

Today

Cafeteria menu — Special: Salisbury steak. Entrees: fried shrimp, deviled crabs, ham steak. Soup: seafood gumbo. Vegetables: buttered carrots, green beans.

Monday

Cafeteria menu — Special: hamburger steak. Entrees: beef Burgundy over noodles, fried chicken. Soup: cream of chicken. Vegetables: buttered corn, carrots, green beans.

Tuesday

Space operations seminar — On-orbit and Launch Window Design will be discussed at an Oct. 8 session of Space Operations Seminars sponsored by JSC, the University of Houston-Clear Lake and the Flight Design/Dynamics Working Council. Registration begins at 7:30 a.m. in the UHCL Bayou Bldg., Rm. 2-311. NASA employees should call Jane Kremer, x32601 to preregister. For more information, call the Software Engineering Professional Education Center, 282-2223.

Free enterprise lecture — A brown-bag luncheon will discuss "The Correlation of Economic Freedom and Living Conditions" at 11:30 a.m. Oct. 8 in the Lockheed Plaza eighth floor Training Rm. Call Charles Campbell at 333-6107 for more information.

Cafeteria menu — Special: turkey and dressing. Entrees: baked meatloaf, liver and onions, barbecue spare ribs. Soup: beef noodles. Vegetables: Spanish rice, broccoli, buttered squash.

Wednesday

Astronomy seminar — The JSC

Astronomy Seminar will meet at noon Oct. 9 in Bldg. 31, Rm. 129. Dr. Greg Ojakangas will report on the Near Earth Asteroids meeting. For more information, call Al Jackson, 333-7679.

Cafeteria menu — Special: Spanish macaroni. Entrees: broiled fish, tamales with chili. Soup: seafood gumbo. Vegetables: ranch beans, beets, parsley potatoes.

Thursday

NCMA conference — The Space City-Houston Chapter of the National Contract Management Association will host a fall regional conference, "Acquisition: The Next Generation," from 7:30 a.m.-4:30 p.m. Oct. 10-11 at the South Shore Harbour Resort and Conference Center. NCMA President Sandra O'Connor will speak. For more information, call Jeff Cullen, x31880, or Cindy Moore, x37589.

SSQ meets — The Society for Software Quality Houston Chapter will hold a charter dinner meeting at 5:30 p.m. Oct. 10 in Bayou Bldg. Rm. 1-427 at the University of Houston-Clear Lake. ISD Deputy Director Jack Garman, Mitre Corp.'s Jack Heberlig, IBM's Tony Macina, Unisys Corp.'s Jack Munson and BMC Corp.'s Ted Van Duyn will discuss the "Next Steps for Software Quality — An Executive Perspective." Panel discussion tickets are \$5. Dinner tickets are \$10 in advance, \$15 at the door. Call Nancy Falk, x32381 for reservations and information.

Cafeteria menu — Special: chicken fried steak. Entrees: beef pot roast, shrimp chop suey, pork chops. Soup: navy bean soup.

Vegetables: carrots, cabbage, green beans.

Oct. 11

Space Flight Banquet — The North Galveston County Chamber of Commerce will present its fourth annual Space Flight Banquet at 7:15 p.m. Oct. 11 at the South Shore Harbour Resort and Conference Center in League City. Astronaut Charlie Bolden will be the after-dinner speaker. For more information, call Gwen Neugent, 337-3565.

Astronomy Seminar — The JSC Astronomy Society will meet at 7:30 p.m. Oct. 11 at the Lunar and Planetary Institute, 3303 NASA Road 1. Paul Peterson will discuss and demonstrate telescope mirror testing. Weather permitting, there will be an observing session following the meeting. For more information, contact Eleta Malewitz, 489-2197.

Cafeteria menu — Special: tuna and noodle casserole. Entrees: broiled codfish, fried shrimp, baked ham. Soup: seafood gumbo. Vegetables: corn, turnip greens, stewed tomatoes.

Oct. 14

Columbus Day — Most JSC offices will be closed in observance of the Columbus Day holiday.

Oct. 15

Free enterprise lecture — A brown-bag luncheon will discuss "False Economic Ideas and Their Origins" at 11:30 a.m. Oct. 15 in the Lockheed Plaza eighth floor Training Rm. Call Charles Campbell at 333-6107 for more information.

Swap Shop

Swap Shop ads are accepted from current and retired NASA civil service employees and on-site contractor employees. Each ad must be submitted on a separate full-sized, revised JSC Form 1452. Deadline is 5 p.m. every Friday, two weeks before the desired date of publication. Ads may be run only once. Send ads to Roundup Swap Shop, Code AP3, or deliver them to the deposit box outside Rm. 147 in Bldg. 2. No phone of fax ads accepted.

Property

Sale: Dickinson, 3-2.5, 2 acres, \$87K. Rick, x32695 or 559-2735.
 Sale: La Porte, 3-2.5-1, 2 story, lg corner lot, \$10K equity, assume \$506/mo note. 474-2660.
 Rent: Arkansas lake cabin, wooded, 4 acres, screened porch, furn, wkly/dly, \$250/\$50. 338-2517.

Lease: Nassau Bay, 4-2.5-2, fresh lake waterfront, pool, FPL, 3K sq ft, \$2K/mo, avail Oct 1. Phil, x37892 or 333-9518.

Lease: Meadowgreen, 4-2.5-2, lg living area, DR, breakfast area, inside util, pool, landscaped, \$1250/mo plus dep, avail Jan. 488-4608.

Sale: League City, Countryside, 3-2.5-2A, 2 story, lg fenced lot, no approval, \$15K down plus \$692/mo. 554-7623.

Rent: Galveston condo, furn, sleeps six, pools, cable TV, wknd/wkly/dly rates. Magdi Yassa, 333-4760 or 486-0788.

Sale: Pearland, Dixie Hollow, lot, paved street, all util. x39530 or 482-5003.

Sale/Lease: Friendswood, 3-2-3D, formals, lg paneled den w/FPL, lots of storage, \$700/mo. 283-5781 or 480-9716.

Lease: Piper's Meadow, 3-2-2, FPL, W/D conn, fans, \$795/mo, avail Nov. 1. x31826 or 480-9436.

Cars & Trucks

'90 Ford Ranger PU, super cab, 4.0L-V6, 17K mi, ex cond, \$9K. 334-1458.

'87 Mitsubishi Precis, good cond, 46K mi, \$2.2K. Kim, 282-1712 or 286-7873.

'76 Cadillac Coup de Ville, 64K orig mi, 500cc, good cond, \$1.8K OBO. (409) 938-4793.

'82 Ford Lariat F150 PU, loaded, \$2.5K. 534-3131.

'74 BMW 2002, 4 spd, green w/tan int, new tires, new \$2K paint job, sun roof, AM/FM/cass, ex cond, \$8K OBO. David, x32791 or 488-9768.

'85 Lincoln Town Car, silver, low mi, ex cond, \$7.2K, 644-2616.

'89 Chevy Cavalier Z-24, V6, blue, auto, A/C, AM/FM/cass, P/L, P/W, luggage rack, 21K mi, ex cond. 486-1487.

'68 Mercedes 250S, classic, maroon, auto, A/C, no rust, \$4K. Bauch, x31309 or 333-3382.

'80 Pontiac Phoenix, V6, A/C, 4-dr, auto, AM/FM/stereo, lifetime batt, good cond, \$1450. x30092 or 481-3637.

'89 Ford Probe GT, 100K mi warranty, loaded, ex cond, \$9850. 280-2780 or 457-2850.

'84 Honda Prelude, AM/FM/cass/stereo, moon/sun roof, A/C, P/S, runs great, 86.5K mi, \$3K. 333-6018 or 486-9513.

'86 Mazda RX-7, 52K mi sports package, A/C, AM/FM/cass/stereo, \$6280. Phil, 488-

4453.

'53 Chevy PU, orig equip, \$1.9K OBO. 534-6750.

'83 Monte Carlo, \$2.5K OBO. Gretchen, 283-0446 or 482-6744.

'87 Mustang GT, red, 5 spd, ex cond, loaded, \$9.5K. 488-4373.

'87 Pontiac Grand Am, 3.0L, V6, ex cond, \$3K. x35786 or 486-6125.

'90 Dodge Dakota convertible PU, 9.8K mi, ex cond, blue w/whit top, 12/12 factory warr, 5/50 service contract, alarm, rust protection, loaded, \$15K. 333-9742.

'82 Chevy C-10 Silverado PU, A/C, P/S, P/B, AM/FM/cass, good cond, 71K mi, \$3K. 334-1303.

'78 Camaro, 305, V8, runs well, low mi, needs body work, \$1K OBO. x31427.

'83 Mazda GLC Hatchback, 5 spd, \$1250 OBO. Dave, 283-5468 or 486-5286.

Cycles

'88 Honda XR600 dirt bike, ex cond, low mi, \$1.8K. Bill, 992-3032.

'78 Husqvarna 390, off road, good cond, \$500. Norman, 280-2590.

Man's Raleigh Gransport touring bicycle, 531 Reynold's alum frame, Shimano gears, quick release hubs, alloy rims, \$150, x33565 or 992-2306.

'86 Honda Helix scooter, 250cc eng, 1K mi, new batt, alarm, red, \$1.1K firm. Joanna, x31615 or x34279.

'85 Yamaha RZ 350, red/whit/blue Kenny Roberts replica, 5K mi, \$1.2K OBO. Jim, 585-0679.

Boats & Planes

Boat gas tank, 23 gal, approx 46"x14"x8". 332-0365.

'85 18' Robalo, center console, 150 Evin, low hrs, only one year in saltwater, dual batt, Bimini, fish finder, galv trlr, \$9K. 334-1458.

'89 Evinrude, 30hp, elec start, loop charged control cables, shift lever/accel, steering cable w/steering wheel, warranty, \$2K OBO; '61 14' Semi-V alum boat w/trlr, trlr has new hubs, bearings, bearing buddies, leaf springs, \$450 OBO. 487-7332.

15' alum Monarch Jon boat, galv trlr, 9.8 Mercury O/B, ex cond, \$950 OBO. x35961 or 532-2050.

Piper Cub ultra light, sale or trade. 762-6233.

'84 Invader V171, Volvo AQ 125, ex cond, \$4.8K. Mark, x30160 or 326-3004.

17' fiberglass boat, '85 Mercury 75/hp O/B w/powertrim, walk-thru windshield, equipped for ski, seats 8, trlr, Bimini top, ex cond, \$3.2K. 333-7180 or 333-9581.

Audiovisual & Computers

Curtis-Mathis AM/FM record changer stereo console, \$75. 488-3588.

GE VHS camcorder, 2 yrs old, comp w/batt, charger and carrying case. x31105 or 480-7924.

Four industry std Shure SM58 dynamic mics, ex cond, \$90/ea w/cases; 2 JVC MD-580A dynamic mics, good cond, \$50/ea w/cases; Sunpak 522 auto Thyristor, handle flash, G/N 240 w/batt pack, filter set, AC adapter, batt charger, PC cord, ex cond, \$75. Sy, x30504 or 776-9754.

IBM 386, Super AT clone, 80386 chip, 25

MHz, 80 MB HD, 1.2 MB, 5.25 inch floppy, Super VGA Graphics, 256 colors, MS DOS 5.0, expanded keyboard, stand-up case, game card, joystick, 3 mos old, warranty, may incl software, \$1.6K OBO. Mike, 283-4286 or 480-9414.

McIntosh MC240 audio amplifier, \$1K. Jeff, x36254 or 488-2609.

IBM AT clone, VGA display, 65 MB HD, 1 MB RAM, 16 MHz, enhanced keyboard, MS mouse/windows 3.0, other software inc, Panasonic LQ2500 ptr, \$2K; Novateil cellular phone w/carrying case, 5 yr warr, \$250. Stephen, 282-8753 or 488-3436.

New NEC Powermate PC, 5x20/44 MB HD, VGA moni, 256K VGA card, \$1.9K. 488-4373.

Technics 100W stereo rack sys w/cab, good cond, \$375; misc stereo equip, Yamaha, Sony, JVC. 280-9461.

Pets & Livestock

Free, 2 female cats, 1 long hair Calico, 1 short hair gray, both declawed. 282-4208 or 480-4501.

Parrot, redheaded Amazon w/cage, \$450. Sandy, 337-3122.

Free labrador puppies, shepherd mix, 6 blk w/whit, 1 gray/whit. 332-2453.

Baby cockatiels. Linda, 484-7834.

AKC Boston terrier, 9 mo, \$200 OBO. 474-9435.

Household

Queen sz sleeper sofa, good cond, \$125; butcher block style computer desk, dark stain, \$100; 3 hanging light fixtures, \$15/\$20/\$35. Steve, x37626.

Broyhill lowback pit set, walnut frame w/camel fabric, was \$1.8K, \$350 OBO. 332-0365.

Sofa and chair, \$300; marble inlay tables, coffee, end, drum, cab w/mirror, \$100/ea. 488-3588.

4 piece BR set, 1930 Blond wood, \$300; 2 pc side-by-side dresser/desk w/shelves, dark walnut, \$200 OBO. 480-3260.

King sz matt and box springs, new; Tunturi rowing machine; chest of drawers w/hutch; Eclipse speakers. 482-8820.

Panasonic lg cap microwave, \$75; screen for sliding glass dr, \$10; glass panels for sliding glass dr, BO; gas range top incl counter-top, BO. Ben, x30755 or 486-2633.

King sz waterbed, light wood, w/semi-motionless matt, 12 drwr pedestal, mirrored/hutch hdbd, padded rails, good cond, \$425. 283-5341 or 332-3307.

Queen sz flex steel sofa hide-a-bed, good cond, \$300. x37284.

Queen sz waterbed, oak, w/12 drwr pedestal, motionless matt, bookcase, hdbd, htr, rails, satin sheets, matt pad. 991-6503.

Sofa bed, was \$400, now \$150; dinette set, was \$300, now \$100; answering machine, \$40; king sz bedding, \$15; dish set, \$20; 40L suit, \$10. 333-5179.

Queen sz waterbed, semi-motionless, matt pad, sheets, padded rails, new htr, filler kit. \$75. Howie, 282-3841 or 482-8354.

Sofa w/hide-a-bed, brwn/whit, ex cond, \$50, x31497 or 554-4215.

Sears foam matt/box spring double sz, clean, good cond, \$60. Gene, x30182, 480-9580.

Sealy full-sz matt/box springs, \$100; 2 bot-

ties of 5-in-1 carpet cleaner for Bissel steam carpet cleaner, \$10. x33233.

Antique DR tbl, 6 chairs, china cabinet, buffet, \$950; Victorian walnut buffet, 3 orig beveled glass mirrors, \$550; barley twist tbl, \$75; camphor wood trunk w/antique lock, \$200; lg cedar trunk, \$100; red glass punch bowl and 12 cups, \$50. 992-4959.

New Kenmore elec dryer, \$225. 282-4705 or 280-8449.

Complete antique/whit king sz BR suite, solid wood, incl matching triple dresser w/mirror, 6 drwr chest, hdbd, metal frame, \$550; corner daybeds, w/corner tbl, \$200; Tappan microwave, 700 W, ex cond, \$125; 2 sleeper sofas, \$65/ea; kitchen tbl w/leaf and chairs, \$35; coffee tbl w/end tbls, \$35. x32847 or 488-5601.

2 leather sided glass top coffee tbls, \$50/ea; two 15" wheel covers, \$25/ea. James, 335-6710 or 482-6744.

Twin bed frame/box springs, \$15. 286-0022.

Dinette tbl, round butcher block top, 4 chairs w/navy floral cushion seats, \$150 OBO; queen sz metal bed frame, \$10. 283-7551 or 334-5025.

Wanted

Want fully functional piano for about \$500. Rick, x32695 or 559-2735.

Want Sheridan or Benjamin pellet air guns, working or non-working. Tony, x35966 or 488-3238.

Want firm queen sz bed/frame. Jannette, x39188 or 645-8363.

Want riders for vanpool or carpool from SW Alief and Braeswood, 610 locations to CLC/JSC. Satish, 282-4483.

Want non-smoking roommate to share 3-2-2 house in CLC, pool, avail immed, no pets. \$350, \$250 deposit plus 1/3 util, 286-3806.

Want inexpensive computer, Apple II E or other w/educational software, letter-quality printer. Marianne, 333-7343 or 480-6755.

Want baby crib and changing tbl, dark wood preferred. Jere, 992-3151.

Want archery equip, compound bow plus access. Dean, 283-5318 or 488-7032.

Want your removed kitchen cabinets or will help with replacement. Jim, x35852 or 474-7747.

Want riding lawnmower, 5hp, in good cond. Magdi Yassa, 333-4760 or 486-0788.

Want female housemate to share 3-2-2 house in The Landing, private 2 rms, bath, \$350 mo plus 1/2 util. 332-1420 or 554-4944.

Want adult sz football helmet w/chin strap and face guard, cheap. 283-7533.

Miscellaneous

Tent, sleeps 4, \$25; girls bike, old but works, free; Polaroid single lens reflex, SX-70 camera w/electronic flash, \$50; forearm development bar w/weights, \$20. Steve, x37626.

Bicycle rack for playground, park, or school, holds 10 bikes, was \$175, now \$80. 480-3260.

IBM elec typewriter, keytype, \$60; typewriter tbl, \$10; lg wood Peruvian hanging rug w/figures, new, \$90; elec hedge clippers, \$30; several tool boxes, \$10/ea; pair of antique ship benches, 7' long, \$40/both. 488-5564.

Portable elec typewriter, \$100; portable sewing mach, \$120; 9 Neuropsychological

weight control audio tapes and book, \$40; wine rack, \$10; 1990-91 National Geographic, \$5. Sue, x38373.

Marlin 375 cal lever action w/x39 Simmons scope, \$275; scope w/mounts alone, \$100. Pete, 333-6128 or 486-9316.

Drafting table, adjustable w/lamp, \$30; Sears elec typewriter w/extra ribbon, paper injector, repeat spacer, auto-correct key, \$45. Linda, 486-6873, 244-9658.

Sabino crystal collection, 6 pieces, med to lg. BO. Bob, x33149 or 488-7036.

Plants, books, garage sale and craft items, to be sold Oct 19, 18300 Upper Bay Rd, Nassau Bay. Bob, x32193.

Eureka Sanitaire upright vacuum, ex cond, metal attachments, bags, \$115. 333-2830.

Wurlitzer piano, ex cond, \$1.5K; Early Amer sleeper sofa, \$225; matching rocker, \$75; Ethan Allen wing chair, \$225; custom drapes, 86Wx45L, 2 pair, \$80. Sandra, 944-5604.

Craftsman lawnmower, ex cond, \$65; Black and Decker elec lawnmower, ex cond, \$40. Sandy, 337-3122.

Text books for UH central engr class, ELEE 6370/5440 Adv Digital Design, ex cond. Youm, 283-4813.



Metric Measures

National Metric Week harbinger of switch from feet to meters, pounds to kilograms

JSC Metrication Committee members say it won't be long before employees will see dual signs like this mock-up that lists the speed limit in miles per hour and kilometers per hour. From left: Joe Urbach and Gary Butler, Lockheed Engineering and Sciences Co. metrication support workers; Marie Prebilsky, of NASA's Safety, Reliability and Quality Assurance Office; and Joe Maloy, JSC metric coordinator. Switching to the metric system also is affecting employees' lives away from the job. Maloy holds a 3-liter bottle of soda as an example.

JSC Photo by Benny Benavides

Metric Conversion Table

If You Know		Multiply By To Get	
Length:			
Inches	25.4	Millimeters (mm)	
Feet	304.8	Millimeters (mm)	
Yards	0.9144	Meters (m)	
Miles	1.609	Kilometers (km)	
Inches	2.54	Centimeters (cm)	
Feet	0.3048	Meters	
Area:			
Square Inches	6.452	Centimeters Squared (cm ²)	
Square Feet	0.0929	Meters Squared (m ²)	
Square Yards	0.8361	Meters Squared (m ²)	
1 Acre	0.4047	Hectares (ha)	
Square Miles	2.59	Kilometers Squared (km ²)	
Square Miles	259.1	Hectares (ha)	
Volume:			
Cubic Inches	16.39	Cubic Centimeters (cm ³)	
Cubic Feet	0.0283	Cubic Meters (m ³)	
Cubic Yards	0.7646	Cubic Meters (m ³)	
Fluid Ounces	29.57	Milliliters (mL)	
Fluid Quarts	0.9464	Liters (L)	
Gallons	3.7854	Liters (L)	
Fluid Ounces	0.0296	Liters (L)	
Mass:			
Ounces	28.35	Grams (g)	
Pounds (lb)	0.4536	Kilograms (kg)	
1 Ton (2,000 pounds)	0.9072	Metric Tons (t)	
Speed:			
Miles per Hour (mph)	0.447	Meters per Second (m/s)	
	1.609	Kilometers per Hour (km/h)	
Knots	1.852	Kilometers per Hour (km/h)	
Distance:			
Nautical Miles (nmi)	1.852	Kilometers (km)	
Statute Miles (sm)	1.609	Kilometers (km)	
Nautical Miles (nmi)	1.1508	Statute Miles (sm)	
Statute Miles (sm)	0.8689	Nautical Miles (nmi)	
Statute Miles (sm)	1.760	Yards	
Acceleration:			
Inches per Second Squared	2.54	Centimeters per second Squared (cm ² /s)	
Feet per Second	0.3048	Meters per Second (m/s)	
Meters per Second	2.237	Statute Miles per Hour	
Feet per Second	0.6818	Statute Miles per Hour	
Feet per Second	0.5925	Nautical Miles per Hour	
Pressure:			
Pounds per Square Inch (psi)	6.895	Kilonewtons per Square Meter (kilopascals - kPa)	
Millimeters Mercury	133.32	Newtons per Square Meter (Pascals - Pa)	
Pounds per Square Inch (psi)	51.75	Millimeters of Mercury (mmHg)	
Force:			
Ounces Force	0.278	Newtons (N)	
Pounds Force	4.448	Newtons (N)	
Newtons	0.225	Pounds	
Kilograms (kg)	9.807	Newtons (N)	
Flow Rate:			
Cubic Feet per Minute	0.283	Cubic Meters per Second (m ³ /s)	
Gallons per Minute	3.7854	Liters per Minute (L/m)	
Pounds Mass per Hour	0.4536	Kilograms per Hour (kg/hr)	
Pounds Mass per Minute	0.4536	Kilograms per Minute (kg/m)	
Pounds Mass per Second	0.4536	Kilograms per Second (kg/s)	
Pounds Mass per Cubic Foot	16.02	Kilograms per Cubic Meter (kg/m ³)	
Power:			
British Thermal Units (Btu)	1.054	Kilojoules per Hour (kJ/hr)	
Brake Horsepower	0.7457	Kilowatts (kw)	
Electric Horsepower	0.746	Kilowatts (kw)	
Energy:			
Kilowatt Hours	3.60	Megajoules (MJ)	
Temperature:			
°F - 32		Degrees Celsius (C)	
1.8			

By Pam Alloway

Say goodbye to your rulers and grab a conversion table 'cause here comes the metric system.

Over the next few months, JSC will usher in the metric measurement system as the center begins converting from the English or inch-pound system to the new system. Although work to enact this conversion has been under way for months, metrication efforts will receive special recognition as Congress recognizes the week of Oct. 6-12 as National Metric Week.

A JSC Metrication Committee began work in the fall of 1990 following the passage of a 1988 public law that requires federal agencies to convert to the metric system by the end of fiscal year 1992 to the extent that it is economically feasible. JSC Director of Engineering Henry Pohl, formed the committee to determine what would be required to organize a total institutional metrication effort at JSC. With all directorates represented, about 15 committee members drafted transition guidelines and conducted a survey of all JSC directorates.

"The first thing that needs to change is our way of thinking," said Joe Maloy, manager of Standards and Processes and JSC's Metric Coordinator. "We just won't think in inch and pound units. In engineering that means when we measure something, like the inner diameter of a pipe, we'll measure it not in inches but in centimeters... All new reports, all new documentation, all new specifications will be expressed using the metric system."

The JSC metric program will evolve gradually so it doesn't disrupt either existing programs or the existing budget, officials said. The Space Shuttle and Space Station Freedom programs will continue to use the inch-pound measurement systems. Both, however, will need to develop the capability to accommodate metric payloads. All new programs will use the metric system, an important step in maximizing NASA's cooperation with international partners, said committee members.

"Complete conversion would mean everything and that's impossible with the space station which has already been contracted to be in inches and pounds," said Gary Butler, a configuration management specialist who wrote the JSC Metrication Plan after committee members gathered the necessary information. "But we can convert the institutional, day-to-day business to the metric system."

The JSC Metrication Plan is in the directorate level approval process now and should be ready for JSC Director Aaron Cohen's review by the end of October, Maloy said. A NASA-wide Metric Transition Plan is expected to be released by the end of November.

"The JSC Metrication Plan is a transition plan to move us from using the inch-pound system to the metric system," Maloy said. "We'll retain a dual measurement system though to accommodate the fact that this cen-

ter is supporting the shuttle and space station."

After the JSC plan has been approved, each directorate will devise a plan outlining the way in which it will implement the metric system, Butler said.

NASA is interested in the progress of the plan because JSC has taken the lead in the agency's efforts to convert to the metric system, Maloy said.

Switching over to the metric system might take some getting used to even though more than a century has passed since the system was introduced into the American way of life.

In 1875, the U.S. signed the "1875 Treaty of the Metric" and supported the development of a metric system. Then, in 1893, the U.S. adopted the metric measurement standard as its fundamental standard of length and measurement.

Yet more than a century later the U.S. is still not widely using the metric system. In fact, the U.S. is the only industrialized country in the world that is still using the inch-pound measurement system. The only other countries in the world still using the English system are Burma and Liberia.

So why has the U.S. clung to the inch-pound system?

"Because of our ties to the British," Maloy said. "But that's changed and even the British have converted."

England converted to the metric system in 1971, switching its 240-pence to the pound currency system for a new pound divided into 100 new pence.

The U.S. is at long last making efforts to remedy this situation and throughout NASA work is under way to make this transition as painless as possible.

One of the first products of the center's metric effort will be a training program that will make programs and films available to every JSC employee. A three-part video program entitled "The Metric System" will be available from JSC's Technical Library beginning in late October. Officials said soon U.S. citizens will think nothing of driving in kilometers, measuring in millimeters and contributing to the annual blood drive in liters. U.S. currency already is decimal-based at 100 cents to the dollar so the U.S. money system will remain the same.

Along with other federal agencies, JSC will promote industry's switch to the metric system by buying metric goods where available. The federal government is a large enough customer that officials hope this procurement policy will encourage the commercial sector to convert. The Department of Commerce has proposed that all new federal buildings designed and built in late 1994 and afterwards use the metric system.

The on-site effort at JSC is expected to be gradual as new metric programs are contracted and old inch-pound programs are phased out, committee members said. But it's never too soon to start becoming familiar with those conversion charts. □

Newest satellite verifies ozone depletion findings

Preliminary data from NASA's Upper Atmosphere Research Satellite appear to confirm existing aircraft and ground-based research about the chemical processes that lead to ozone depletion.

UARS' observations are providing scientists with a three-dimensional, global map of ozone in the upper atmosphere and a global view of chlorine monoxide, a key chemical in ozone depletion.

These first data were obtained from UARS' Microwave Limb Sounder, one of 10 instruments

aboard the new research satellite deployed from Discovery on Sept. 15. The satellite's orbit, 363 miles above the Earth at a 57-degree inclination to Earth's Equator, provides greatly extended geographic ozone coverage.

UARS is still undergoing testing and is scheduled to begin full science operations in mid-October. Eight other instruments have been activated and spacecraft controllers report verification and testing have been successful.

As the first major element of

NASA's new Mission to Planet Earth program, UARS has begun the global-scale study of the Earth as a complete environmental system. UARS will provide scientists with the first comprehensive data set on the chemistry, wind directions and energetics of Earth's upper atmosphere.

UARS' main focuses are the processes involved in ozone depletion. Ozone, a molecule made up of three atoms of oxygen, blocks the Sun's ultraviolet radiation that poses a health risk to humans and

endangers food crops.

Previous studies using aircraft and ground-based instruments have indicated that reactive chlorine atoms, freed from chemicals such as chlorofluorocarbons, destroy ozone in the upper atmosphere or stratosphere. Chlorine atoms capture oxygen atoms from ozone, creating a molecule of chlorine monoxide and a molecule of oxygen, which does not block ultraviolet light. The chlorine monoxide atom then is broken up, freeing the chlorine atom. Repetition of the

cycle leads to the destruction of thousands of ozone molecules by a single chlorine atom.

The Microwave Limb Sounder instrument aboard UARS continuously measures ozone, chlorine monoxide, temperature and water vapor. It is a collaborative effort with the United Kingdom. Dr. Joe Waters of NASA's Jet Propulsion Laboratory, Pasadena, Calif., and Dr. Gordon Peckham of Heriot Watt University, Edinburgh, Scotland, are the instrument's principal investigators.

Galveston Bay IEEE receives regional award

The Galveston Bay Section of the Institute of Electrical and Electronics Engineers was honored recently with the 1990 Section Membership Growth Award.

Presented by the Region 5 activities board, the award cited outstanding leadership in planning and implementing innovative membership activities that included video conferences, continuing education material and monthly luncheons with distinguished speakers.

Dr. Robert Alden, vice president of the IEEE Regional Activities Board in Laramie, Wyo., presented the award to Dr. Zafar Taqvi, past chairman.

In a related matter, Andy Lindberg, a staff engineer at Lockheed Engineering, received the 1990 IEE Professional Achievement Award from the United States Activities Board. Lindberg, who started the Galveston Bay Section in 1980, was its first president and has served in all executive committee positions except treasurer.

McDonald to speak at next TQM colloquium

Gen. Charles C. McDonald, commander of the Air Force Logistics Command, will discuss his command's quality improvement efforts in the next NASA Total Quality Management Colloquium.

The colloquium will be televised in Bldg. 16, Rm. 111 from 2-3:30 p.m. Tuesday, and will be broadcast on Channel 4 of the JSC Television Distribution System.



PRESIDENTIAL ADVICE — Dr. D. Allan Bromley, the assistant to President Bush for science and technology, talks with Charlie Price, chief of the Robotics System Technology Branch, during a visit to JSC last weekend. Among those accompanying him were NASA Administrator Richard Truly, Associate Administrator Arnie Aldrich, JSC Director Aaron Cohen and Deputy Director P.J. Weitz, Engineering Director Henry Pohl and Mission Operations Director Eugene Kranz. Bromley was invited by NASA Administrator Richard Truly to tour the facilities and discuss Space Station *Freedom* and the use of new technologies in the space program.

JSC Photo by Robert Markowitz

Interchange raises cooperation curtain

(Continued from Page 1)

report and it really provides a basis for where we go from here," Cooke said. "Everybody has identified potential issues or studies that need to be performed to prove out concepts in their own areas."

The conference closed Thursday with

NASA presenting its initial evaluations of two of the four basic architectures proposed in the Synthesis report.

Cooke said participants agreed to plan for another technical interchange in December, but that an exact date has not yet been established.

Five earn commendations for work to save NASA 2

Five Aircraft Operations employees at Ellington Field recently received special commendations for putting out a fire that endangered the NASA 2 aircraft.

Flight Crew Operations Director Don Puddy presented the plaques to civil servant Danny Taylor and Northrop Worldwide Aircraft Services employees Jeff Lightfoot, Joe Bezner, John Perry and Herb Griffin.

The incident occurred April 30 when Lightfoot, an Aircraft Ops mechanic, was bleeding fuel from one of NASA 2's engines and a spark ignited the fuel.

Lightfoot jumped off the ladder to get away from the fire, but remembered that the fuel boost pumps needed to be switched off. He tried to get back inside the cockpit to do so, but discovered he couldn't walk because of a fractured heel he suffered during his fall from the ladder. He was able to crawl about 50 feet to relative safety.

Bezner was at the foot of the ladder when the blaze began. The fuel was being vented into a bucket wired to the engine, and the bucket burst into flames. Bezner jerked the burning bucket of fuel away from the aircraft,

suffering burns to both hands, but saving the aircraft from major damage.

Supervisor Griffin saw the fire and rushed to the cockpit, grabbed the cabin fire extinguisher and secured the fuel boost pumps to prevent the fire from getting out of control. He then left the aircraft by way of the aft cargo hatch and went to the front of the plane to lend more assistance.

Meanwhile, Taylor and Perry took an aircraft tow tractor and retrieved a large Halon fire extinguisher, which they used to put out the fire.

Team formed at JSC to determine cause of cracks

(Continued from Page 1)

An engineering team from the Orbiter Project Office at JSC has been formed to determine the causes of the cracks.

So far, the analysis has shown that the normal loads experienced by the seals in flight are low in comparison to the stresses required to cause a crack, and that in-flight stresses do not account for the cracks. The team is now concentrating on understanding all of the stresses and loads experienced by the seals, including

those incurred on the ground. The cracked seals have been sent to LTV Inc. in Dallas for in-depth studies.

The analysis will continue until a clear picture is resolved, but early findings indicate the cracks are not a safety-of-flight issue and will not be a constraint to the launch of *Atlantis* on STS-44.

Atlantis is to be moved from the the processing hangar to the Vehicle Assembly Bldg. in mid-October and the STS-44 launch remains tentatively targeted for

late November. In the VAB, the solid rockets and external fuel tank for STS-44 are connected and waiting for *Atlantis*.

Meanwhile, *Discovery* was moved into the new Orbiter Processing Facility 3 on Sept. 27. This week, residual propellants are being drained and the orbiter's attachments used for the ferry flight from California are being removed.

In OPF 1, *Endeavour* continues to undergo preparations for a first launch on STS-49.

Contract provides computer services

(Continued from Page 1)

During the first eight years, the government can issue delivery orders for hardware, system software, services and maintenance up to maximum quantities specified in the contract.

The five additional one-year options are for hardware and system software maintenance only.

Because of its indefinite delivery/indefinite quantity feature, the value of the OADP contract will

depend upon the number and type of systems, equipment and services which NASA orders. It is anticipated that about \$191 million in delivery orders may be issued during the 13-year contract period.

The computer systems provided for in the contract will be used in the Space Station Mission Control Center and the Space Station Training Facility. They also will be used in upgrading systems in the Mission Control

Center and Shuttle Mission Training Facility. The contract will provide ground-based computer systems for future, yet unspecified, programs at the JSC and other NASA centers.

The contract requires IBM to provide commercial off-the-shelf hardware and system software as well as commercially available system engineering, maintenance and training services as specified in delivery orders issued against the contract.

JSC recruiters hit bricks for quality workers

A cadre of JSC recruiters kicked off a fall trek to universities across the country this week.

The recruiters, who include JSC Director Aaron Cohen and Deputy Director Paul J. Weitz, will visit 21 different schools during the next two months.

Duane Ross, chief of Human Resources' Program Support Branch, said the primary goal is to find potential high-quality employees of the future.

"We try to build a pool of quality applicants," Ross said. "During the year, when managers and supervisors have vacancies they need to fill, they come to us as a resource."

Having NASA employees visiting campuses also provides the colleges and universities with a helpful public relations tool.

Engineering's Sharyl Butler and Center Operations' Charles Noel were the first to hit the road after last Friday's kick-off meeting. They visited Texas Southern University and Prairie View University this week.

Weitz and Engineering's Steve Poulos will visit Penn State University on Thursday and Friday.

Engineering's Kaylene Kindt will visit the University of Oklahoma Oct. 22-24.

Flight Director Wayne Hale will travel to Rice University Oct. 28-29.

Engineering's Karen Edelstein will visit the University of Michigan Oct. 29-30, and John Sunkel will travel to the University of Colorado Oct. 29-31.

Engineering's Reagan Redman will seek out prospective employees at the University of Houston Oct. 30-Nov. 1, and Mission Operations' Mark Ferring will travel to the University of Notre Dame Oct. 31-Nov. 1.

Jerry Borrer of MOD will visit the University of Texas-San Antonio and Engineering's Chris Cerimele will visit the University of Cincinnati on Nov. 5-6.

Human Resources Deputy Director Greg Hayes will be at Stanford University Nov. 6-7, and Engineering's Mark Hammerschmidt will be at Purdue Nov. 7-8.

Cohen and Stacey Nakamura will recruit at the Massachusetts Institute of Technology Nov. 13-14, and Engineering's Barry Wittschen will be a Georgia Tech Nov. 13-14.

Galileo data shows lightning on Venus

Scientists who studied the planet Venus from data received from the interplanetary spacecraft Galileo have greatly increased confidence that there are lightning storms in that planet's atmosphere.

The science team used the spacecraft's plasma wave instrument to detect electromagnetic equivalents of thunderclaps most probably generated by lightning bolts deep in the atmosphere.

Galileo flew by Venus at a distance of about 10,000 miles in February 1990. Pictures and other observations of the planet were recorded and then transmitted to Earth in November 1990, according to plan. Scientists have been analyzing the data since then.

Galileo's primary scientific objective is to conduct close and extended observations of Jupiter, its atmosphere and its moons, beginning in December 1995. Launched in 1989, it was programmed to fly by Venus and Earth for gravity assists to help it reach Jupiter. It flew by Earth in December 1990 and is currently in the Asteroid Belt where it will obtain a close look at the asteroid Gaspra this October before returning for a second and final Earth flyby in December 1992.

Space News Roundup

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Editor Kelly Humphries
Associate Editors Pam Alloway
Kari Fluegel

Child Care Center 4-year-old openings

The JSC Child Care Center has several openings in the 4-year-old class, and the waiting list for that age has been exhausted.

The class consists of a maximum of 15 children, supervised by two full-time degreed teachers.

Parents may leave their children from 7 a.m.-5:30 p.m. Cost is \$77 per week.

Interested parents should contact Georgia Strain at x34734 for information on how to place a child at the center.