



Virtual EVA

Virtual reality is being used in training for the first time in Hubble Space Telescope servicing simulations. Story on Page 3.



Screen test

The JSC Clinic will offer blood pressure screening tests on-site as part of its new Total Health wellness program. Story on Page 4.

Space News Roundup

Vol. 32

August 9, 1993

No. 31

Cautious shuttle brass reset launch for Thursday

Discovery's attempt to come after meteor shower of uncertain strength

By James Hartsfield

Discovery is now scheduled to launch Thursday following a postponement to avoid an annual meteor shower that has astronomy experts uncertain of its potential strength.

Shuttle managers decided July 30 to postpone the launch, which had been scheduled for Aug. 4. Discovery is now set to launch at 8:10 a.m. CDT Thursday, and a new countdown will begin at 10:30 a.m. today.

The STS-51 crew — Commander Frank Culbertson, Pilot Bill Readdy and Mission Specialists Dan Bursch, Jim Newman and

Carl Walz — are scheduled to leave Ellington Field bound for Florida at 11:30 a.m. today. Once at the Cape, the crew once again will go through final pre-launch briefings and fit checks, and the commander and pilot will fly landing approaches.

The Perseids meteor shower, so named because of the constellation in which the majority of meteors appear, is predicted to peak this year sometime on the night of Aug. 11. Calculations of the risk posed by the



strongest recorded meteor showers proved to be within levels of debris risk that have been seen on past shuttle flights from Earth orbital debris, however, many astronomers said they feel this year's Perseids could be a unique event.

The Perseids are caused as Earth passes through the orbit of the comet Swift-Tuttle, and calculations show that Earth will pass more squarely through that comets' orbit this year than ever before. Managers consult-

ed with a wide array of astronomy experts outside NASA and were unable to quantify just how strong the shower may be as well as the size of particles that may be involved.

"Our review of the data indicates the STS-51 mission could be flown safely during the Perseids event," said Shuttle Director Tom Utzman. "However, we also recognized that this year's Perseids activity is a unique event that may not be completely predictable. Therefore, the team felt the best overall course of action would be to wait until after the

Please see **COLUMBIA**, Page 4

Colleagues plan gala for Cohen

Friends and colleagues of retiring JSC Director Aaron Cohen are being invited to honor him for his profound contributions to America's human space program at an Aug. 27 Space Center Houston gala.

Cohen will retire from NASA on Aug. 20 after a distinguished career in government and industry aerospace to become the Zachry Professor of Engineering at his alma mater, Texas A&M University.

"I hope you will take this opportunity to join us in recognizing the career of an eminent public servant and leader in American aerospace," said Paul J. Weitz, who will take over as acting JSC director following Cohen's departure.

The black-tie optional gala will begin at 8 p.m. and feature hors d'oeuvres and a cash bar. A brief program will begin at 9:15 p.m. Tickets are \$20 and must be purchased in advance at Space Center Houston ticket windows or by telephone with a major credit card; call 483-4273 from 8:30 a.m.-4:30 p.m. Monday-Friday until Aug. 25.



JSC Photo by Robert Markowitz

SPINOFF SOARS — Cybertek Systems Corp. research engineer Jennifer Griffin gives a demonstration of her company's PER-Force hand controllers to Lyman Hazelton, a scientist at the Massachusetts Institute of Technology's Center for Space Research, at SOAR '93. The hand controller uses force reflection to give telerobotic operators a tactile feel for the forces at work in graphical or remote environments. The seventh annual Space Operations, Applications and Research Symposium and Exhibition was held this past week at JSC's Gilruth Center.

NASA extends host center job announcements

By Kelly Humphries

NASA has decided to extend until Aug. 26 eight NASA-wide job announcements that cover 300 new positions to be located at the new host center for the Space Station Program Office.

Any application received after close of business Aug. 26 will not be considered. JSC employees may mail their applications directly to Headquarters Code FPP, or deliver them to the Employee Services Section in Bldg. 45, Rm. 140. No faxes will be accepted.

Throughout the application period, JSC's Human Resources Office will continue to provide assistance to employees applying for the jobs.

One new service that began being offered by the Employee Services Section this past week is a Space Station Transition Hotline. Employees may pose questions about things such as early retirement and buyout packages through a telephone recorder at 244-8008. Employee Services is collecting the questions daily and getting back to each employee as soon as possible, definitely within 24 hours.

The reorganization is designed to eliminate all current space station project jobs. The new jobs, which fall into four basic categories, and their corresponding grade levels are:

- Aerospace technologist engineers, GS/GM12-15 if non-supervisory or GM14-15 if supervisory;
- Contract specialists, GS/GM11-14 if non-supervisory, GM14-15 if supervisory;
- Payloads engineers and scientists, GS/GM12-15 if non-supervisory or GM14-15 if supervisory; and
- Other administrative specialists (such as resource analysts, configuration managers and computer specialists), GS/GM11-14 if non-supervisory, GM13-15 if supervisory.

Any NASA civil service employee who has the necessary qualifications may apply for the positions. The announcements are not open to job seekers from the private sector. Because the location of the host center has not yet been determined, employees who accept job offers will be allowed to change their minds if a move becomes necessary.

The location of the host center is expected to be announced after Congress reconciles the House and Senate versions of the spending bills that include NASA appropriations.

Please see **STATION**, Page 4

Bagian takes leave to do clinical research

By Barbara Schwartz

Astronaut James P. Bagian, M.D., P.E., is taking a leave of absence from NASA to work as vice-president of corporate development and medical affairs at Somanetics Corp.

Bagian will use his medical and engineering expertise to head up the Troy, Mich., company's clinical research activities. He will return to flight status upon his return to NASA.

Bagian became an astronaut in July 1980 and took part in the planning and provision of emergency medical and rescue support for the first six space shuttle flights. He was a mission specialist on STS-29 in March 1989 and on STS-40 in June 1991.

On his first flight, Bagian was principal investigator for an experi-



Bagian

ment to study the changes of cerebral blood flow and its relationship to space adaptation syndrome and space motion sickness. He was the first to treat space sickness with the drug Phenergan by intramuscular injection, which was the first successful treatment regimen for the symptoms. This method now has been adopted by NASA as the standard of care for the control of space sickness in shuttle crews.

Bagian's second flight was the first Spacelab Life Sciences mission, and the crew members performed experiments which explored how the heart, blood vessels, lungs, kidneys and hormone-secreting glands

respond to microgravity, the causes of space sickness and changes in muscles, bones and cells which occur in humans during space flight.

Four payload commanders get flight assignments

Jernigan on STS-67, Jones on STS-68, Voss on STS-69, Ochoa on STS-66

By Barbara Schwartz

Four astronauts have been assigned as payload commanders for upcoming space shuttle missions.

Tamara E. Jernigan, Ph.D., Thomas David Jones, Ph.D., James S. Voss, and Ellen Ochoa, Ph.D., will have overall responsibility for long-range planning and integration of payloads on their respective missions, and provide expertise for the coordination of science activities.

Jernigan, 37, who holds degrees in engineering science, space physics and astronomy, is payload commander on the STS-67 Astro-2

mission scheduled for late 1994 aboard Columbia. Astro-2 is a mission to study the far ultraviolet spectra of faint astronomical objects using imaging and spectroscopy and to study the polarization of ultraviolet light coming from hot stars and galaxies.

Jernigan was a mission specialist on STS-40 Spacelab Life Sciences-1 in June 1991 and on STS-52, a mission to deploy the Laser Geodynamics Satellite to measure the movement of the Earth's crust, operate the U.S. Microgravity Payload-01 and test the Space Vision System developed by the Canadian Space

Agency in October 1992.

Jones, 38, is payload commander on the STS-68 Space Radar Laboratory-2 mission scheduled for late 1994 aboard Atlantis. SRL-2 will take radar images of the Earth's surface for Earth system sciences studies including geology, geography, hydrology, oceanography, agronomy and botany.

Jones has a doctorate in planetary science and is a mission specialist on SRL-1 in the spring of 1994.

Voss, 44, who has a master of science degree in aerospace engineering sciences and is an Army lieutenant colonel, is payload com-

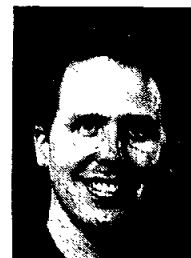
mander on the STS-69 SPACEHAB-04 and Shuttle Pallet Satellite-III mission scheduled for early 1995 aboard Discovery. SPACEHAB is a complement of commercial experiments flown in a pressurized module in the Shuttle's cargo bay as a supplement to the middeck area of the orbiter. SPAS-III is a group of instruments that will measure the atmosphere around the orbiter and the background clutter in the Earth's atmosphere.

Voss was a mission specialist on STS-44 in November 1991, which deployed a Defense Support Program satellite and conducted

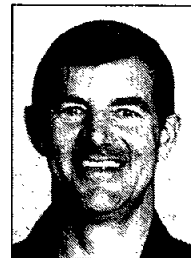
Please see **OCHOA**, Page 4



Jernigan



Jones



Voss



Ochoa

JSC

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Store from 10 a.m.-2 p.m. Monday-Thursday and 9 a.m.-3 p.m. Friday. For more information, call x35350 or x30990.

Astros vs. San Diego Padres (1:35 p.m. Sept. 19, Astrodome): \$9; on sale until Sept. 3.

Moody Gardens — Discount tickets to three of five attractions: \$14.

Six Flags Over Texas — Discount tickets: one-day pass, \$19.95; two-day pass, \$24.95 and children under four feet, \$18.95.

Splash Town USA — Discount tickets: \$10.50.

Astroworld — Discount tickets: adult, \$18.95; children under 41/2 feet, \$15.95.

Waterworld — Discount tickets: \$9.95.

Sea World in San Antonio — Discount tickets: adult, \$19.75; child (3-11), \$13.15.

Fiesta Texas, San Antonio — Discount tickets: adult, \$18.35; child (6-11) \$12.75.

Sea World and Fiesta Texas — Discount coupons: \$6 off discount prices if tickets purchased for both parks.

Space Center Houston — Discount tickets: adult, \$7.50; child (3-11) \$4.50; commemorative: \$9.95.

Metro tickets — Passes, books and single tickets available.

Movie discounts — General Cinema, \$4.50; AMC Theater, \$3.75; Loews Theater, \$4.

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 two weeks in advance. For more information, call x30304.

EAA badges — Dependents and spouses may apply for photo identification badges from 6:30-9 p.m. Monday-Friday. Dependents must be between 16 and 23 years old.

Defensive driving — Course is offered from 8 a.m.-4:30 p.m. Aug. 21. Cost is \$19.

Weight Safety — Required course for employees wishing to use the weight room is offered from 8-9:30 p.m. Aug. 11. Pre-registration is required; cost is \$5.

Aerobics — High/low-impact class meets from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is \$32 for eight weeks.

Exercise — Low-impact class meets from 5:15-6:15 p.m. Mondays and Wednesdays. Cost is \$24 for eight weeks.

Aikido — Martial arts class meets from 5-7:30 p.m. Tuesdays. Cost is \$15 per month.

Country and western dance — Beginners class meets from 7-8:30 p.m., intermediate class meets from 8:30-10 p.m. for six weeks beginning Aug. 9. Cost is \$20 per couple.

Ballroom dance — Beginners and beginners intermediate classes meet from 7-8:15 p.m.; intermediate and advanced classes meet from 8:15-9:30 p.m. beginning Aug. 12. Cost is \$60 for eight weeks.

Fiction workshop — Class will meet from 6:30-9 p.m. beginning Aug. 18. Cost is \$80 for five weeks.

Tennis lessons — Classes meet from 5:15-6:45 p.m. Beginners class starts Aug. 16; advanced class begins Aug. 18. Cost is \$32 for eight weeks.

Sign language — Class meets from 5-6:30 p.m. beginning Aug. 16. Cost is \$55 for six weeks.

Scuba diving — Class will meet from 6:30-9 p.m. Tuesdays and Thursdays beginning Aug. 26. Cost is \$190 for four weeks.

Basketball and volleyball — Registration for the fall season will be the week of Aug. 16.

Fitness program — Health Related Fitness Program includes a medical examination screening and a 12-week individually prescribed exercise program. For more information, call Larry Weir at x30301.

JSC

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 AF3, or deliver them to the deposit box outside Rm. 147 in Bldg. 2. No phone or fax ads accepted.

Property

Sale: Galveston Island lot 60'x120' on canal, Jamaica Beach. 388-4526 or 538-3119.

Sale: Pearlland 5.8 acres, cleared, cross fenced, city water, sewer, approved for horses, \$9k/acre. 965-2988 or 485-5003.

Sale: Univ Trace condo, 2 BR, cov parking, pool, W/D, \$35k. James, 286-1934.

Rent: El Dorado Trace condo, 2-2, W/D, wet bar, ceiling fans, car port, 1100 sq ft, \$520/mo, avail Sept. 333-6962.

Lease: Univ Trace condo, 1 BR, study, W/D, DW, ceiling fans, all elec, \$475/mo. 488-2946.

Sale: CLC, Oakbrook, 4-3-2, new carpet, paint, skylites, 2500+ sq ft, 16'x32' pool, 16'x32' deck, 2 zone hi eff A/C, gas heat/hot water, \$110k, \$30k equity assum. Wil, x37439 or 286-3057.

Sale: CLC, lg 4-2-2, fenced, \$90k. 282-3479 or 532-1112.

Sale: Dickinson, 4-3-2D, gourmet kit, breakfast rm, game rm, FPL, wet bar, sunken LR, lg wooded lot w/circle drive, park boat/MH, \$122k. Shirley, 335-1607 or 335-0641.

Sale: 3-2-2 TH 3 mi west of downtown Houston, pool, alarm, 2 FPL, wet bar, wood floor in DR, \$90k. x30886 or 863-1005.

Lease: CLC, 3-2-2, fenced, no pets, \$700/mo, \$500 dep, avail Aug 1. 326-6782.

Sale: Pipers Meadow, 3-2-2, DR, breakfast nook, FPL, lg yard, open floor plan, 7 yr warr on A/C, ex cond, \$79.9k. 286-2724.

Sale: LC lot, 82'x130', \$9.5k. x36514.

Sale: Shorecrest, 4-2-2 w/pool and extra woodlot lot, custom drapes, new carpet, 1850 sq ft, \$89k. 470-2592.

Sale: Pipers Meadow, 3-2-2, new A/C, carpet and paint, corner lot, cul-de-sac, \$79k. 286-1309.

Lease: Sageglen, 4-2-2, formal LR/DR, den, breakfast rm, FPL, ceiling fan, refrig, CCISD, \$950/mo, no pets. 282-3229 or 286-4547.

Sale: Pipers Meadow, 4-2-5-2, new carpet/flooring, FPL, ceiling fans. x36617 or 291-9020.

Rent: El Lago waterfront marina condo, 2-1, remodeled, new carpets and appliances, cov parking, \$565/mo. x31246 or 333-9161.

Sale/Lease: Kemah, Clear Lake Shores, 4-2-2, approx 2000 sq ft, ceiling fans, mini blinds, lg yard, trees, skylight, formal DR, no pets, \$77k or \$775/mo + dep. 334-2335.

Cars & Trucks

'84 Ford Club Wagon XLT, 106k mi, seats reupholstered, new carpet, \$4800. 554-6242.

'85 Dodge Lancer 4 dr, \$1200; '77 Chevy Impala, \$900; '87 Chevy 1/2 ton PU, \$1000. 996-6981.

'88 Tbird Turbo Coupe, loaded, 32k mi, \$12k, nego. x30705 or 486-1430.

'87 Hyundai Excel, 4 dr, A/C, tinted windows, AM/FM stereo, garaged, well maintained, ex cond, 59k mi, \$2.9k. x33662 or 334-6794.

'59 Karmann Ghia convert, rebuilt motor, \$6.5k OBO; '74 Volvo wagon 145, rebuilt motor, clean

int, new A/C, \$1.65k. 280-5853.

'89 Ford Escort LX, 4 dr, clean, \$2k. Martin, x34625 or 926-3117.

'88 Hyundai 2dr htchbk, needs front alignment, \$500. John or Bill, x32272 or 286-2315.

'69 Mustang, restored w/rebuilt engine, ex cond, \$5k; '90 Yamaha Radian 600, good cond, \$2.6k. James, 286-1934.

'91 Acura Integra GS, red, 46k mi, ex cond, \$11.5k. 484-4652.

'85 Honda Civic 4 dr sedan, 5 spd, 93k mi, \$1.2k OBO. Hal, x30503 or 488-2273.

'85 Olds Cutless Supreme, PW/PL, AM/FM/cass, Dave, x34271 or 962-2465.

'87 Toyota Camry Deluxe, 4 dr, A/C, PS, cruise, AM/FM/cass, tinted windows, white w/burgundy int, \$5.8k OBO. x30974 or 554-7083.

'78 Olds Omega, V6, auto, A/C, PS, PB, 78k mi, garaged, ex cond. x38265 or 482-5871.

'71 Chevy Nova, V8, orig owner, \$4.5k. 480-1998.

'85 Escort EXP, 120k mi, \$800. David, x45381.

'91 Chevy conversion van, top of the line, ex cond, 1 owner. Bill, 554-5834.

'87 Mitsubishi Cordia, grey w/ blk int, A/C, radio, 5 spd, ex cond. 680-4189 voice pager or 721-8654.

'78 Corvette, 25 yr Silver Anni Edit, leather oyster int, L82 eng, auto, loaded, T-tops, 58k mi, \$10.5k. Herb, x34325 or 482-3546.

'79 MG Midget, last yr made for U.S., runs well, \$2.45k. 286-5971.

'77 Coachman pop-up camper, 20', sleeps 8, 12v/110 pwr conv, sink, stove, closet, fully equipped, awning, \$1.5k. 334-3615.

'90 Ford Probe LV, V6, 45 k mi. pwr everything, loaded, extended warr, \$7.5k. Mark, 286-3533.

'88 Honda Accord DX, good cond, 2 dr, auto, 95k mi, blue, \$5k. Keith, x38952 or Bill, 486-5483.

'80 Lincoln Town Car, loaded, leather, ex cond, \$4k nego; '85 Ford Escort EXP, 5 spd, good cond, \$1.4k. x46260 or 286-6486.

'78 Porsche 928, brwn w/leather int, auto, ex cond, 75k mi, \$8.5k. Bill, x48889.

'88 Mitsubishi Galant Sigma, auto, loaded, pwr sun, leather seats, theft det, new tires/breaks, \$4.9k. Ted, x36894 or 992-4814.

'85 Dodge Daytona, 5 spd EFI, PS/PB, AM/FM/cass, no rust, \$1.3k. 482-1429.

'82 Honda Accord htchbk, ex motor, A/C, \$1.2k or trade for sm PU. Tony, x30028.

'91 Nissan Stanza XE, auto, loaded, 55k mi, \$9.9k. James, x40045 or 332-1129.

'83 Nissan Pulsar Turbo, ex cond, sun roof, low miles, A/C, new tires, 1 owner, \$3.5k. 520-3829.

'77 MG Midget, good for parts, \$250 OBO. Brian, 534-2358.

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JSC

Dates & Data

Today

Total Health kickoff — The Gilruth Center will host weight training presentations at 11 a.m. and 4 p.m. in the weight room.

Cafeteria menu — Special: breaded outlet. Entrees: baked chicken, beef chop suey, smoked sausage and German potato salad, French dip sandwich. Soup: cream of broccoli. Vegetables: okra and tomatoes, peas, navy beans, baby carrots.

Tuesday

Total Health kickoff — JSC's new Total Health wellness program will host a pond party around the duck ponds from 11 a.m.-2 p.m. Information about various wellness activities will be available.

HAL-PC meets — Images taken with the NASA-developed Electronic Still Camera will be featured at the next meeting of the HAL-PC Users Group at 7 p.m. Aug. 10 at the George R. Brown Convention Center. Software Publishing Corp. will use the digital images to demonstrate its new Superbase software package.

Blood drive — Loral will host a blood drive from 7-11:30 a.m. Aug. 10 at 1322 Space Park, and from 1:30-4:30 p.m. Aug. 10 at 1816 Space Park. Call 333-6311 for more information.

Cafeteria menu — Special: fried chicken. Entrees: Salisbury steak, steamed pollock, vegetable lasagna, French dip sandwich. Soup: split pea and ham. Vegetables: mixed vegetables, French cut green beans, pinto beans, vegetable sticks.

Wednesday

Total Health kickoff — The JSC cafeteria will introduce a special Total Health entree that is low in fat

and calories.

PSI meeting — The Clear Lake/NASA Area Chapter of Professional Secretaries International will meet at 5:30 p.m. Aug. 11 at the Holiday Inn on NASA Road 1. Kimberly Schulz, a licensed professional counselor, will present "The Superwoman Syndrome—How to Do it All for Others and Still Have Time for Yourself." Dinner is \$10. Reservations are due by 1 p.m. Aug. 9; call Bee Kelly at 474-6207, or fax reservations to 474-6272.

LDARS demonstration — The Space Shuttle Program Office's Management Integration Office will demonstrate a new Launch Documentation Archival and Retrieval System at 9:30 and 10:30 a.m., and 1, 2 and 3 p.m. Aug. 12 in the Bldg. 30 auditorium. LDARS provides on-line access to a variety of shuttle launch documentation such as operations and maintenance instructions and requirements, launch commit criteria and system drawings.

Blood drive — Rockwell will host a blood drive from 8-10:30 a.m. Aug. 11 at its Logistics Support Facility, Feathercraft and Gemini. For details, call Jimmy Tarbuton at 283-6932.

Cafeteria menu — Special: stuffed bell pepper. Entrees: fried catfish with hush puppies, stir-fry chicken and rice, Wieners and beans, Reuben sandwich. Soup: seafood gumbo. Vegetables: buttered rice, Italian green beans, corn O'Brien, peas and carrots.

Thursday

Total Health kickoff — The Employee Assistance Program will host a lunch and learn session on "Whole Person Wellness" featuring Dr. Roy Marsh at 12:30 p.m. in the Bldg. 3 cafeteria.

Cassio CT-615 elec kybd, stand, stool, AC adapter, carrying case, sustain pedal, ex cond, was \$300, now \$225. 481-6928.

Household

Kg sz waterbed, rosewood frame, ex cond, \$150. x36535.

Kg sz waterbed w/cherry 6 dwr dresser and mirror, good cond; dbl bed, good cond, BO. x30705 or 486-1430.

Refrig/freezer, \$200; washer, \$100; gas dryer, \$100. 332-6752.

Qn sz bed, matt, box spring, hdbd, frame, ex cond, \$125. Randy, x36563.

Round kitchen table w/4 chairs, solid wood, ex cond, \$300 OBO. 333-4102.

Dbl oven \$130; 5 burner rangetop, \$60; Magic Chef elec copertone built-ins; stainless steel sink w/single handle faucet, \$25; LazyBoy recliner, \$85, all ex cond. 488-4487.

Qn sz motionless waterbed/bedroom suit, black, incl chest, mirror, bedside table, hdbd and frame w/cabinets, all \$500. 992-5394.

New Berber carpet, lt brwn, approx 10'x10'; Navajo rug from Shiprock area. x38278 or 334-7258.

Carpet, rust/cinnamon, 150 yds, \$375 all or \$3/yd. Mark, x38013 or 992-4132.

Daybed w/2 bolsters, can dbl as single bed or couch, \$60; microwave oven, 115V, 13 amps, ex cond, \$110. 482-5621.

13.3 cu ft upright freezer, \$200. 333-6592.

Kg sz canopy waterbed w/dwrs and storage case pedestal, light pine solid wood w/brass trim, bookcase hdbd w/bev mirror, ex cond. x41041 or 474-9161.

Antique drop leaf tables, \$150; antique round oak table, 5 matching chairs and buffet, no dealers, \$900. Jim Poindexter, x38624 or 475-9671.

Sofa and matching chair, country blue, ex cond, \$350 OBO. Chris, 992-4870.

French Provincial RCA console stereo AM/FM record player, \$50; Lazy Boy vinyl recliner chair, dk brwn, \$25. x37300 or 482-7529.

Wards dryer, \$40. x47049.

Mistubishi lg screen TV, 45", stereo, all features and options, was \$3.3k, now \$1.6k or trade for working truck or classic car. 488-0345.

Wanted

Want sm chest or upright freezer. x31698 or 334-1336.

Want non-smoking fem roommate to share 4 BR house in Pipers Meadow, no pets, \$285/mo, util incl. Theresa. 333-6191 or 480-6980.

Want elec charging unit for very old Rockwell hand calculator mod #61R, to see if my unit still works. Ray, x31375 or 534-4839.

Want to buy frequent flyer miles for ticket to Boston. Martha, x32154 or 486-0427.

Want roommate to share house in Dickinson, nonsmoker, professional, \$350/mo plus 1/2 util. Don, x47667.

Want roommate, nonsmoker, to live in my 4 BR/2 bath Friendswood home, all household privileges incl, \$250/mo, no dep, bills paid. Michael, x38169 or 482-8496.

Want to buy Honda or Chevy for parts. 867-8820.

Want roommate to share Middlebrook 3-2-2 w/spa, \$350/mo + 1/2 util, M or F. Robert, 286-5406.

Want Norell Netware V3.11 training material, will buy, rent, or borrow. Lee, x41015.

SSQ meets — The Society for Software Quality will meet at 5:30 p.m. Aug. 12 at the Days Inn on NASA Road 1. Erick Rivas, director of engineering at Protosoft Inc., will present "Using CASE Technology to Improve Quality." For more information, contact Felix Balderas at x31945.

Blood drive — Rockwell will host a blood drive from 8-11:30 and 1-2:30 p.m. Aug. 12 at 600 Gemini. Call Liz Sanders at 282-3418 for details.

Cafeteria menu — Special: barbecue smoked link. Entrees: turkey and dressing, beef stroganoff, chopped sirloin, French dip sandwich. Soup: tomato Florentine. Vegetables: Lima beans, buttered squash, Spanish rice, oriental vegetables.

Friday

Cafeteria menu — Special: meat sauce and spaghetti. Entrees: rainbow trout, liver and onions, been cannelloni, pork and shrimp egg roll, Reuben sandwich. Soup: seafood gumbo. Vegetables: steamed broccoli, breaded okra, cut corn, black-eyed peas.

Monday

Cafeteria menu — Special: turkey and dressing. Entrees: breaded veal cutlet, beef chop suey, steamed pollock, beef cannelloni, French dip sandwich. Soup: beef and barley. Vegetables: Brussels sprouts, mixed vegetables, egg plant casserole, winter blend vegetables.

Aug. 18

TQM luncheon — The Center Operations Directorate is sponsoring a brown bag luncheon from 12-1 p.m. Aug. 18 in Bldg. 12, Rm. 254. Nancy Aldrich, senior staff scientist at Futron, will discuss team building. For more information, call Joe Olivarez Jr. at x34022.

Want carpool partner San Leon/Bacliff to JSC. x38373.

Want fiberoptic designer/technician to assist in construction of device for patent (applied for) for fiberoptic connector. x30003.

Want '78 or '79 Ford PU, no rust or dents on cab or front end, rest not important. 922-7240.

Want nonsmoking roommate to share 3-2.5.2 in LC Meadowbend, \$300/mo. +1/3 util and dep. Gloria, x31891 or 538-2283.

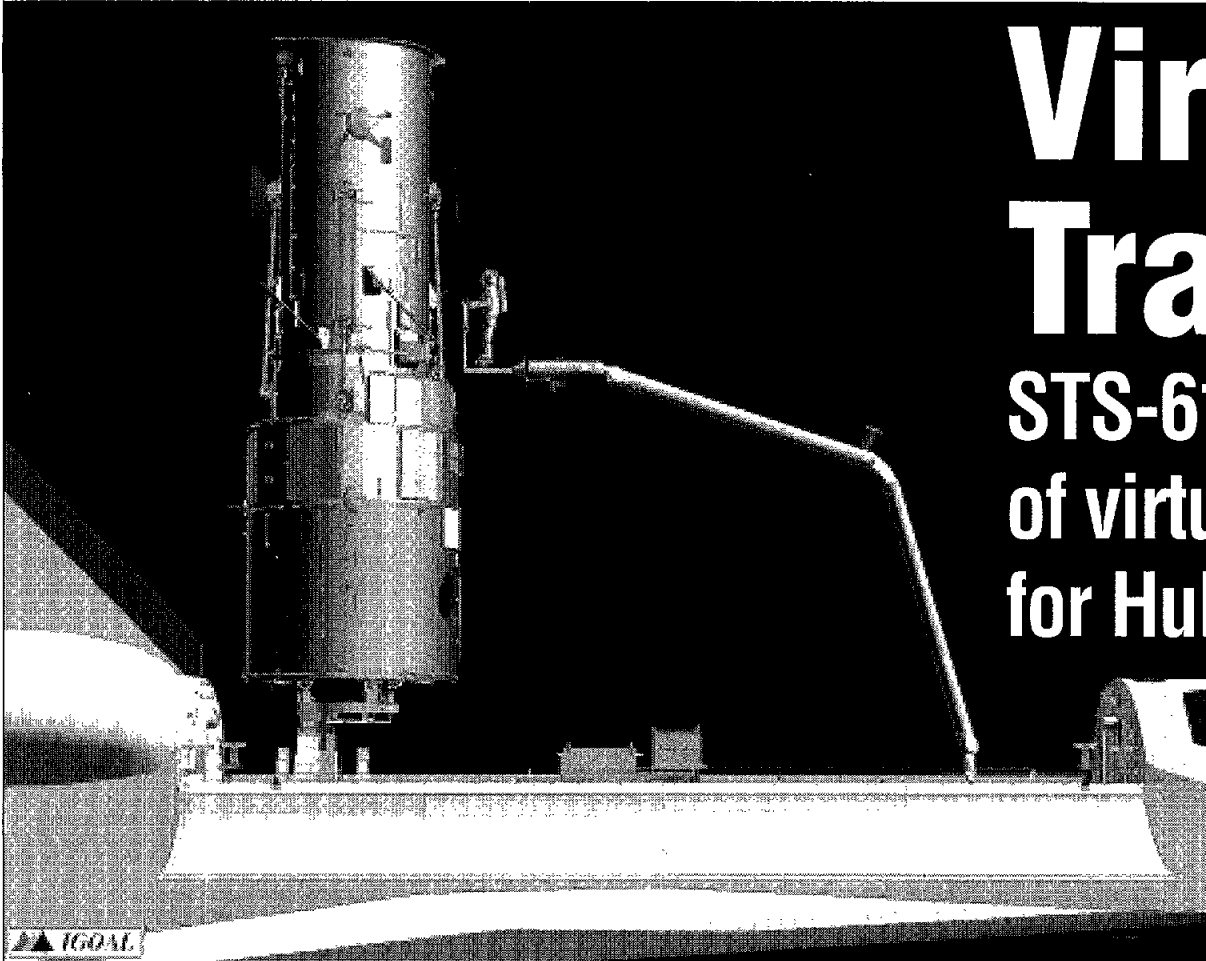
Want 2 wheel 5'x8' utility trlr w/g wheels and 3k lb or more capacity, pay up to \$300 for good one. Bob, x37300 or 482-7529.

Want high school student w/car to mow grass on Sat. Walter, x37332.

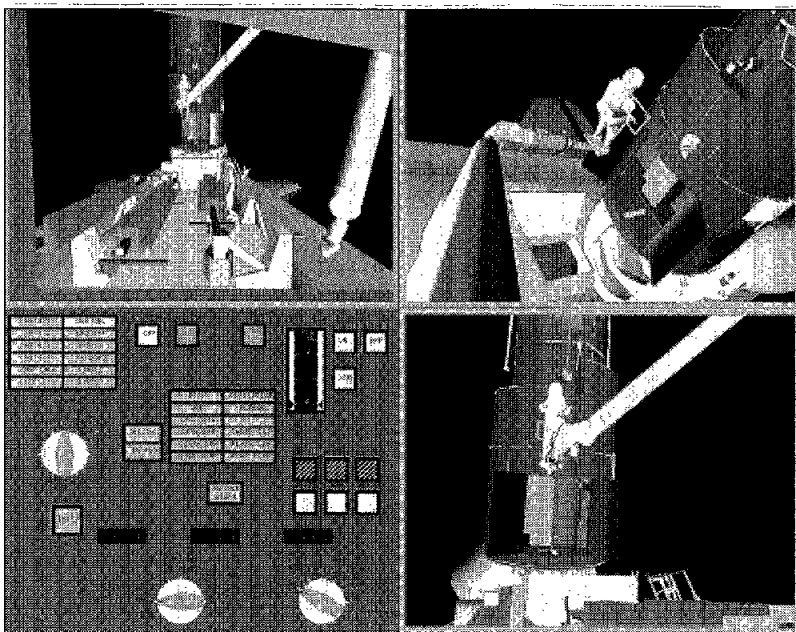
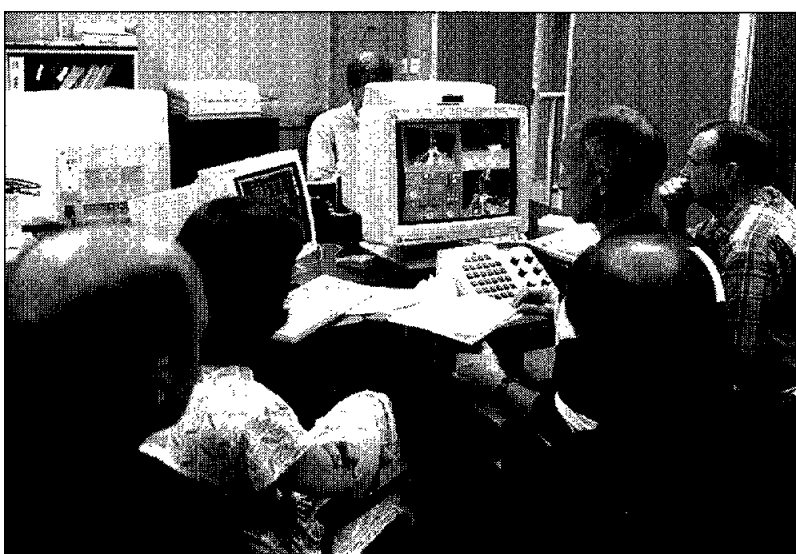
Want someone to watch 4 yr old in CL area, 5 days/wk; want responsible person to rent room in Friendswood, util paid, \$250/mo. 480-3424

Virtual Training

STS-61 crew makes first use of virtual reality as training aid for Hubble servicing mission



Above: In this computerized virtual reality display, STS-61 Mission Specialists Jeff Hoffman and Claude Nicollier familiarize themselves with the flow and voice protocols they will use for the space work that will service the Hubble Space Telescope. Nicollier is using the virtual reality version of the remote manipulator system to maneuver Hoffman's likeness, seen on the portable foot restraint, while Hoffman "sees" the portions of the telescope in his likeness' field of view. Top right: STS-61 crew members gather around Nicollier at the virtual reality work station that controls the robot arm. From left are Pilot Ken Bowersox, Mission Specialists Kathy Thornton, Nicollier and Tom Akers. Lower right: Another display shows the virtual reality control panel being used by Nicollier to control the robot arm. Bottom left: Another computer display shows how Hoffman sees the payload bay and the replacement solar arrays. The space suit gloves represent Hoffman's virtual hands and can grasp and move other items in the simulation. Bottom right: Hoffman wears the helmet and gloves that allow him to project himself into virtual reality.



By Kelly Humphries

It's not the holodeck on the Starship *Enterprise*, but a new virtual reality simulation system that's being used as a space walk training tool for the Hubble Space Telescope servicing mission is showing a lot of promise.

STS-61 Mission Specialists Jeff Hoffman and Claude Nicollier have spent about 16 hours working in the virtual reality environment that includes three-dimensional images of *Endeavour* and its robot arm, as well as the HST. The system's most valuable training contribution so far has been in helping establish a mutually agreed upon set of terms they will use when Hoffman is in the payload bay working on the satellite and Nicollier is inside the shuttle driving the robot arm.

Dave Homan, special assistant to Engineering's Automation and Robotics Division chief, is managing the project in the Bldg. 9 Integrated Graphics, Operations and Analysis Laboratory. IGOAL's Mike Goza is working with Metrica's David Shores and Lincom's Brad Bell to develop the HST training package on several computers and work stations. The computers are linked together, with one driving the left eye display, one driving the right eye, one driving sensors, another driving the robot arm.

When subjects put on the virtual reality "helmet," which uses stereoscopic monitors with a 100-degree field of view to immerse the trainee in the virtual environment, they can see the HST, its various components and the tools they will be using. Two fiber optic-equipped gloves, which are displayed as extravehicular mobility unit gloves in the visual displays, allow the trainees to "grasp" objects and move them about.

Homan said one reason his group picked the HST servicing mission for this first test of the system's training capabilities was because they wanted to have access to crew members as test subjects so that they could get input from the people who ultimately will be the users. As the STS-61 crew members receive their training, they also provide feedback that helps the system's designers understand which aspects of this new simulation tool are useful and which aren't.

One area that has turned out to be useful is the ability to tie EVA and robot arm simulations together. Underwater neutral buoyancy tanks provide a good simulation of the EVA activities, and simulators such as the manipulator development facility provide a good simulation of arm operations. But the best way of tying those two aspects together before virtual reality came to town was to have an inflatable "astronaut" on the arm in the

MDF, and a crew member walking down in the payload bay trying to envision what it would be like to be the inflatable on the arm.

With virtual reality, Hoffman can actually see things from the perspective of where he will be standing on the manipulator foot restraint as Nicollier is driving the virtual reality arm. When Nicollier turns Hoffman upside down, he actually sees things upside down.

So far, virtual reality has many limitations, said Ellen Ochoa, one of the Astronaut Office's automation and robotics liaisons. While it is a good familiarization tool that doesn't require as many people as water tanks and shuttle mission simulators to operate, it doesn't provide tactile feedback.

"We see it filling a gap in our training facilities," Ochoa said. "We don't at this time have a way of realistically doing integrated RMS and EVA training."

"When they're working on their command protocols, when the MFR guy says move me 'up' or 'down,' he needs to make sure that the RMS guy understands what 'up' and 'down' is, or what 'right' and 'left' is or what 'fore' and 'aft' is — whatever command they use so that they both know exactly what the other is expecting," Homan explained.

Ochoa said the STS-61 crew already has used virtual reality experiences to suggest changes in robot arm positions after discovering in the simulation that an EVA crew member couldn't see what he needed to see or that the robot arm had reached the edge of its capabilities.

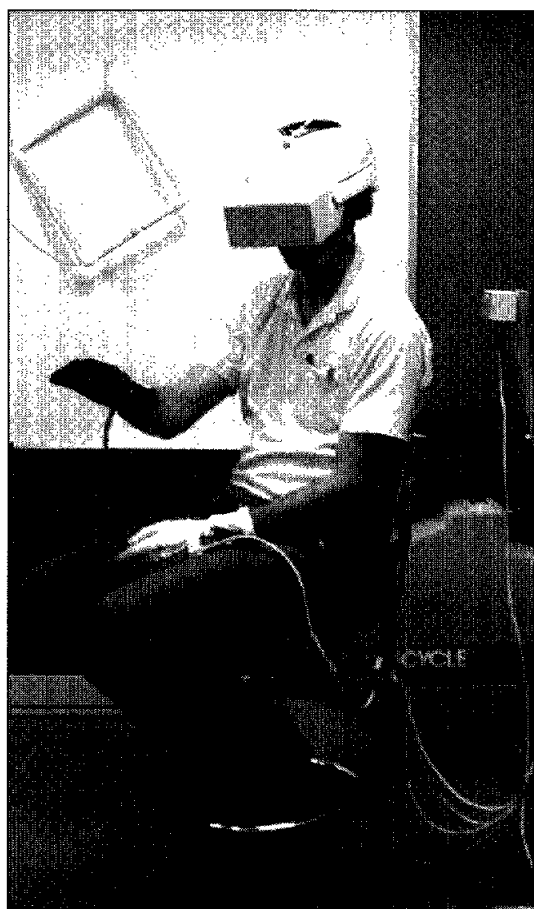
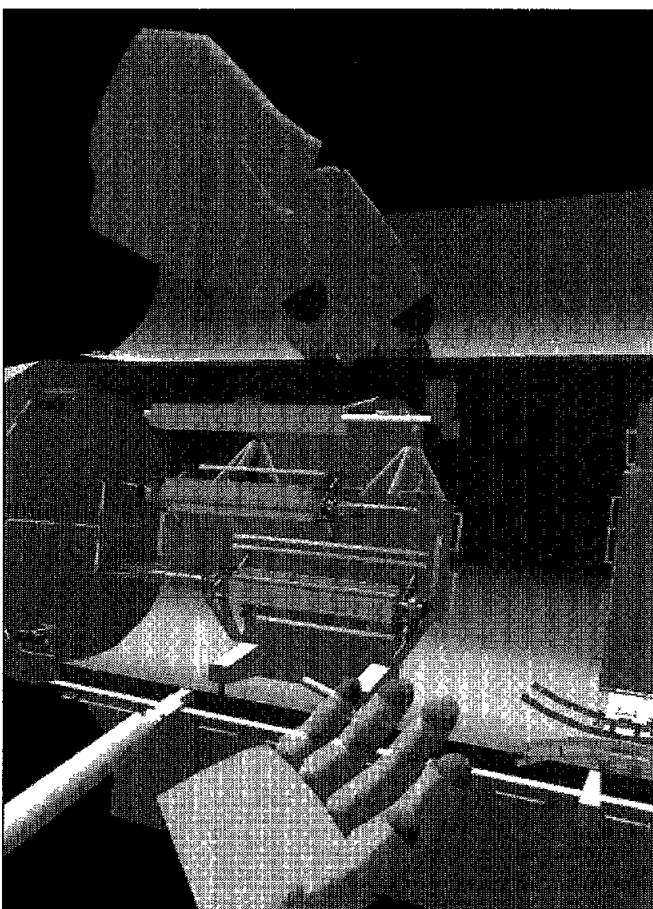
"It's not training in the way that a lot of people think of training," Goza said. "We can put together a simulation of a wrench and a tool board and you can go put the wrench on and turn the nuts and bolts. But it turns out if you don't know how to use a wrench before you get into this, it isn't going to teach you how to use a wrench. It's going to show you more procedurally when, where and why you want to use the wrench, and in what sequence you want to do a particular thing."

Homan said JSC's old Mission Planning and Analysis Division first began working with virtual reality in 1985, putting together its first "helmet" out of miniature Watchman televisions. Private industry has improved virtual reality technology to the extent where computers and graphics machines are fast enough to recreate activities with reasonable fidelity and update rates.

"We're trying to figure out how useful it is and what its potential is," Homan said.

The Automation and Robotics Division hopes to put together a complete system that can be dedicated to training future crews, as well as for continued development of virtual reality applications such as teleoperation of robots and manipulators. □

JSC Photos by Kyle Herring



Compton Gamma-Ray Observatory finds bright x-ray pulsar

Using NASA's Earth-orbiting Compton Gamma-Ray Observatory, scientists have discovered a powerful pulsar which has become one of the brightest x-ray sources in the sky during the past two weeks.

Several hundred pulsars emitting radio energy have been found, but only about 30 have been found that emit x-rays, all of them within the Milky Way galaxy. The new pulsar is thought to be one of an even smaller class of a half-dozen objects called transient x-ray pulsars. These undergo enormous change in brightness on time-scales ranging from hours to years.

A pulsar is an unusual celestial object or system that emits pulses of radiation at regular intervals. The new pulsar emits a pulse of x-rays

every 93.5 seconds. That also is the period of rotation for the pulsar. A pulsar's flashes of energy are emitted much like the sweeping motion of a lighthouse beam.

The energy outbursts occur when matter, emitted as a "solar wind" from a high-mass star, falls onto a neutron star in orbit around it. A neutron star, although it has a diameter of only about 12 miles, and about the same mass as Earth's sun, has a much higher gravitational field since it is so dense.

Continued observations will be required to determine if the newly discovered object definitely is an object of this type. The new pulsar is designated GRO J1008-57 and is in the southern constellation Carina.

"When we first saw this pulsar in

our data, it was a tremendous moment," said Dr. Robert B. Wilson of the Space Science Laboratory at Marshall Space Flight Center. "For two years we had been watching the data and up to now, we had only observed previously known pulsars. All such observations are useful in trying to understand these objects, but it's much more exciting when you find something new."

The new object was first observed in data from a Compton instrument called the Burst and Transient Source Experiment, which can view the entire sky simultaneously. The source brightened from the initial detection level to become as bright as any other known x-ray pulsar in five days, remained there for about two weeks and now has started to

decrease.

The BATSE pulsar data analysis team which discovered the gamma-ray pulsar is led by Wilson. Initial discovery of the pulsed signal from the object was made by Mark Stollberg, a Ph.D. graduate student at the University of Alabama in Huntsville, and Dr. Mark H. Finger of the Gamma Ray Observatory Science Support Center at NASA's Goddard Space Flight Center, Greenbelt, Md.

Astronomers around the world were notified of the new pulsar by a circular distributed by the Central Bureau for Astronomical Telegrams in Cambridge, Mass.

A wide-field optical plate of the region containing the source has been made by an observatory in

Australia, under the direction of Dr. Malcolm Coe of the University of Southampton, England, to attempt to identify the companion star. BATSE alone can provide the location of the source to an accuracy of only about 2 degrees, so it is a difficult task to find which star is the optical counterpart.

Special maneuvers of the Compton Observatory are being made so that the other experiments aboard the observatory can view the new pulsar and perhaps, supplement the BATSE data.

The Compton Observatory has been providing data on x-ray pulsars since it was launched aboard *Atlantis* in April 1991. Compton has observed about 15 of the objects to date.

Garman leads information management

Jack Garman, deputy director of the Information Systems Directorate, has been designated the senior installation information management official for JSC. JSC Director Aaron Cohen announced Monday.

In this new capacity, Garman will be responsible for approving the JSC IRM Manual, the JSC Automated Information Systems Security Manual and the annual JSC Information Technology Systems Data report.



Garman

He also is responsible for all information processing resources utilization, acquisition and disposition reports required under NASA's April 1992 Information Resources Management Handbook, and all JSC Federal Information Process Resources Decision Documents.

Garman will appoint a federal information processing resources acquisition manager, designate a center computer security manager and appoint all JSC representatives and alternates to the NASA committees specified in the Information Resources Management Handbook. He can be reached at x36231.



JSC Photo by Robert Markowitz

CHICK CHECK — Taft Broadcasting Co. operations and production worker Jim Parido checks on a mother killdeer who has made a nest and laid an egg in a parking lot island near his office in Bldg. 8. Parido said he checks on the bird regularly, and places sticks around the nest to help his fellow employees see the nest before they trod upon it.

Workshops give tips on cultivating professional edge

By Audrey Schwartz

JSC employees and contractors can gain insights from nationally recognized experts in professional image building, financial planning and communications by attending a series of half-day professional development workshops scheduled for Aug. 23-24 at the Gilruth Center.

Debra A. Benton, an international specialist in self-presentation, will lead a session focusing on "The Power of Professional Presence" to be held from 8:30 a.m. to noon Monday, Aug. 23, and repeated at 1-4:30 p.m. Attendees will learn how to make a memorable first impression in work situations, to interact successfully with others and to project the best possible professional image.

Author of "Lion's Don't Need to Roar," Benton has conducted executive development and career counseling seminars in 16 countries and has appeared on many television programs including "The CBS Morning News." She has developed professional image programs for DuPont, AT&T, Sara Lee, Union Carbide and PepsiCo.

"Budgeting and Planning Your Financial Future" will be the topic of the seminar from 8:30 a.m. to noon Tuesday, Aug. 24. Beth Hearn, a certified financial planner and registered investment adviser, will show participants how to develop or revise a financial plan at any age. Hearn will show step-by-step basic budgeting techniques and discuss ways to save and invest for the future. Hearn teaches at area community colleges and conducts money management workshops for

industry and government.

Noted author and business communication specialist Madelyn Burley-Allen will help participants master the essential, but often neglected, art of listening from 1 to 4:30 p.m. Tuesday, Aug. 2. The "Excellence in Effective Listening" workshop will demonstrate the techniques of active listening, the seven steps to better remember names and the characteristics of the three levels of listening. Burley-Allen will help participants assess their own listening skills through a communication self-evaluation.

Burley-Allen is the author of three books, "Listening: The Forgotten Skill," "Managing Assertively, How to Improve Your People Skills" and "Memory Skills in Business." She has presented more than 2,000 communications seminars worldwide and is listed in *Who's Who* of America.

All JSC civil servants and contractor employees may attend the workshops as their workloads permit. Sponsored annually by the Federal Women's Program, the professional development workshops are targeted for both men and women.

No advance registration is required and the workshops are free. JSC civil servants will receive training credit for attending and completing a registration form at the workshop.

A shuttle bus and van will be able to transport on-site attendees to and from the workshop; taxi service will not be available to the Gilruth Center.

For more information about the workshops or the bus schedule, contact Pam Adams at x33761.

Clinic offers blood pressure screenings

The JSC Clinic, in conjunction with the American Heart Association, will sponsor a "High Pressure Program" the week of Aug. 30 providing free blood pressure tests at various sites around the center.

High blood pressure is a silent killer that can lead to heart disease, stroke or kidney failure if not treated. However, high blood pressure usually presents no symptoms or warning signs. The only way to diagnose this potentially crippling disease is through a simple, quick screening check.

The following is the schedule and sites for blood pressure screenings:



total health

Aug. 30: Bldg. 1, 8:30-11:30 a.m.; Bldg. 7A, 1-2 p.m.; Bldg. 32, 2:30-3:30 p.m.;

Aug. 31: Bldg. 30, 8:30 a.m.-noon; Bldg. 16, 1-2:30 p.m.; Bldg. 31, 3-4 p.m.

Sept. 1: Bldg. 45, 8:30-11:30 a.m.; Bldg. 44, 1-2 p.m.; Bldg. 325, 2:30-4 p.m.

Sept. 2: Bldg. 419, 8:30-10 a.m.; Bldg. 273 at Ellington Field, 10:30-11:30 a.m.; Bldg. 15, 1-2 p.m.; Bldg. 4 south, 2:30-4 p.m.

Screenings also will be held daily during the week in the Bldg. 8 from 10 a.m. to noon and 2-4 p.m. For more information, call the clinic at x34111.

Station job announcements open until Aug. 26

(Continued from Page 1)

Employees Services will continue to provide a room where employees may review and get copies their personnel files, prepare listings of past position titles, reassignments and promotions, and make available computer work stations where employees can fill

out their Standard Form 171 applications.

The work stations, available by appointment, are in Bldg. 111 and the ISD Product Center in Bldg. 12. Bldg. 111 will be kept open from 8 am.-7 p.m. so that applicants may use the computers after work, and employees should call Employee

Services at x33086 to schedule a time. The Bldg. 12 computers will be available from noon-4:30 p.m. daily, and employees may call x37572 to see if a station is available. In addition, Macintosh diskettes with copies of the electronic form will be available for loan from Employee Services.

Columbia may roll over this week

(Continued from Page 1)

comet event to launch *Discovery*." The Perseids' peak of activity is predicted to last for only about one hour on Aug. 11 although the exact time the peak will begin is uncertain, and it is unlikely the meteors will be highly visible in Houston.

Meanwhile, at KSC last week, technicians serviced *Discovery*'s cargoes, the Advanced Communications Technology Satellite and the Orbiting and Retrievable Far and Extreme Ultraviolet Spectrometer.

Elsewhere, work on *Columbia* continued in the Bay 2 processing hangar. *Columbia* had a final payload bay cleaning last week and underwent pre-flight test of the landing gear. *Columbia* could be ready to roll over to the Vehicle Assembly Bldg. and be mated with its external tank and solid rocket boosters as early as the end of this week. In the Bay 1 hangar, *Endeavour* remains on schedule for a December flight on STS-61 to service the Hubble Space Telescope.

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.

EditorKelly Humphries
Associate EditorKari Fluegel

Gilruth gives concession stand a try

JSC's Gilruth Center recreation complex has set up a new outdoor concession stand in an effort to hold down registration costs for softball leagues and other sporting activities.

The concession stand, which opened this past week on a trial basis, is offering soft drinks and athletic drinks, and treats such as sunflower seeds, dill pickles, beef jerky, bubble gum and other snacks at

competitive prices.

If the concession stand is a success, a permanent facility is expected to be built.

Recreation Director Christine Jowid encouraged players to support the concession stand. All proceeds from concession stand sales will go into the Employee Activities Association fund and help defer the cost of paying for league officials, bookkeeping and trophies.

Ochoa leads ATLAS-3 planning

(Continued from Page 1)

Military Man in Space and radiation monitoring experiments and numerous medical tests to support longer duration shuttle flights. He also was a mission specialist on STS-53 in December 1992, which deployed a classified Department of Defense payload and conducted Military Man in Space and NASA experiments.

Ochoa, 35, is payload commander on the STS-66 Atmospheric Laboratory for Applications and

Science-3 mission scheduled for the fall of 1994 aboard *Endeavour*. ATLAS-3 continues the series of Spacelab flights to study the energy of the Sun during an 11-year solar cycle and to learn how changes in the Sun's irradiance affect the Earth's climate and environment.

Ochoa has master of science and doctorate degrees in electrical engineering. She was a mission specialist on STS-56 in April 1993, the ATLAS-2 mission.