



Space News Roundup

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Melting metals, growing chips, testing technology

Columbia carrying second United States Microgravity Laboratory

By James Hartsfield

Columbia's countdown clock was ticking smoothly toward the launch of STS-62 today, scheduled to be the second longest shuttle flight in history and focusing on materials processing and space technology development.

Although *Columbia* remained in excellent condition, strong winds in Florida threatened to delay a 7:54 a.m. CST Thursday launch. However, the forecast for today and Saturday showed improvement.

The STS-62 crew—Commander John Casper, Pilot Andrew Allen and Mission Specialists Pierre Thuot, Sam Gemar and Marsha Ivins—arrived at KSC midday Monday to prepare for the launch.

Columbia is planned to reach a 160 nautical

mile orbit, and following launch the crew will activate the United States Microgravity Package-2 experiments in the cargo bay. USMP-2's experiments include furnaces that will study the growth of semiconductor materials, the properties of molten metals, and the behavior of gases at their critical point, where they are simultaneously fluid and gas, in weightlessness.

After about ten days of operations, USMP-2 will take a back seat to the second Office of Aeronautics and Space Technology experiment package. *Columbia's* orbit will be lowered and OAST-2 will study the characteristics of atomic oxygen interaction



with spacecraft as well as a variety of technology development experiments ranging from parts of solar power systems to cooling systems.

Another experiment aboard *Columbia*, developed by JSC's Automation and Robotics Technology Branch, will test a new end effector for the mechanical arm. The add-on tip for the arm incorporates a magnetic capture system rather than mechanical as is currently

used, a force sensor to provide information on how much force is being applied with the arm, and a precise alignment system. The experiment, called the Dexterous End Effector, is expected to increase the arm's dexterity and

alignment accuracy, provide operators with a sense of touch and allow the use of more compact grapple fixtures on satellites and payloads.

Other experiments for the mission involve a series of continuing medical investigations for long shuttle missions; protein crystal growth, bioprocessing in weightlessness, studies of the loss of bone calcium in orbit, and a model of possible space station truss and joint systems to be tested in microgravity.

A launch on time Thursday would have *Columbia* land at 7:02 a.m. March 17 at KSC after spending 13 days, 23 hours and eight minutes in orbit, just one hour and five minutes less than the longest shuttle mission to date, STS-58 in October 1993.

Cameron joins NASA staff at Star City

Shuttle astronaut Ken Cameron will manage NASA operations at Star City and at the Russian control center at Kaliningrad as part of the new partnership effort between the United States and Russia.

As Director of Operations-Russia, Cameron will work with Russian Space Agency engineers and flight controllers on the U.S.-Russian cooperative program and foster continued and enhanced cooperation between NASA and the RSA.

Cameron will supervise NASA astronaut training at Star City, develop a training syllabus for shuttle crew members for Mir rendezvous missions and coordinate training for scientific experimenters. Cameron also will establish and maintain operations, operational relationships, plans and procedures to support flight operations between NASA and the RSA in joint shuttle/Mir flights, and will monitor space station development, assembly and operations. Cameron is expected to command one of the early shuttle docking missions to Mir.

Cameron is a two-time shuttle flight veteran. He was the pilot on STS-37 in 1991 to deploy the Compton Gamma Ray Observatory and served as commander of STS-56 in 1993 to continue studies of the Earth's atmosphere as part of a series of missions called Atmospheric Laboratory for Applications and Science.

Cameron and fellow astronauts Norm Thagard and Bonnie Dunbar, left Houston for Star City on Feb. 23. Thagard and two cosmonauts will be launched aboard a Russian rocket to Mir in March 1995. Three months later, the crew of STS-71 on board Atlantis will dock with the Mir, in the first of up to 10 shuttle visits that will be made to the space station over the 1995-1997 time frame.



JSC Photo by Robert Markowitz

Dr. Benjamin Chavis, Jr., far right, is greeted by Charlie Bolden before making the keynote address highlighting JSC's observance of National Black History Month. Also pictured, from left are Vic Rhoder, Estella Gillette, Lupitz Armendariz, and Chuck Hoskins. Chavis, executive director of the NAACP, spoke on Feb. 25.

Hubble award benefits NASA college fund

By Eileen Hawley

During the Hubble Space Telescope servicing mission in December, the seven-member crew of *Endeavour* displayed a spirit and dedication that earned the admiration of the world and now, NASA dependents will benefit from that "can-do" attitude.

In awarding the STS-61 crew its 1994 Free Spirit Award, the Freedom Forum decided to donate the \$250,000 prize associated with the award to the NASA College Scholarship Fund to honor the accomplishments of crew members Dick Covey, Ken Bowersox, Tom Akers, Story Musgrave, Jeff Hoffman, Kathy Thornton and Claude Nicollier.

"An additional 25 scholarships will be awarded to NASA dependents this year as a direct result of this contribution," said Bill Kelly, chairman of the fund's Board of Directors. "The addition of the 25 scholarships reflects both the generous nature of the donation and the board's desire

to honor the Hubble crew and to commemorate the 25th anniversary of the first lunar landing."

The Free Spirit Award recognizes individuals who embody the principles of free press, free speech and free spirit. "I can think of no undertaking that captures the concept of free spirit better than heading into the uncharted frontier of space and tackling a difficult and complex project that has never been previously attempted," said Freedom Forum award committee deputy chairman John Quinn.

The announcement of the STS-61 crew as this year's award recipient was made by former astronaut Alan Shepard, Jr., a forum trustee. "As a former astronaut, no one knows better than I how much diligence, training and hard work go into a successful space mission," Shepard said. "These seven men and women not only saved a \$2 billion project, they also demonstrated that NASA can

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Sauer co-develops Invention of the Year

A system for controlling microbial contamination in drinking water, developed jointly by Richard Sauer, deputy chief of the Biomedical Operations and Research Branch at JSC, and two contractor employees, has been selected as both the NASA Government Invention of the Year and the NASA Commercial Invention of the Year.

Sauer, along with co-inventors Gerald Colombo and Clifford Jolly of Umpqua Research Company developed the Regenerable Biocide Delivery Unit for use during future long-term or space station missions.

"I believe there is a valuable commercial application for this unit, particularly in developing nations where the need for microbial control of

water supplies is very critical," Sauer said. "This is an effective alternative that doesn't have the drawbacks of the hazardous gases affiliated with purification systems that use chlorine or other conventional methods."

"This is a totally different technology than that used in chlorination systems," Sauer said. "Using elemental iodine to regenerate a resin bed, for example, eliminates the dangers common in the use of chlorine including overtreating the water supply and the storage and use of hazardous chlorine gas."

The water purification system is scalable up to municipal water treatment size creating commercial applications that could in addition,

be of benefit during times of flood or other natural disaster.

"A resin bed containing iodine can be stored safely for a long time," Sauer said. That extended shelf life has the benefit of making the resin bed available on short notice in emergency situations, such as flooding or other natural disasters that impact the potable water supply.

The process also has applications for long-term space flight. "The life of a particular resin bed for purifying water has been limited until now," Sauer said. With the new system, the purifying resin bed can be regenerated in flight using small amounts of elemental iodine. "For space flights or space station missions lasting more than 60 days, a

substantial weight savings can be realized by carrying a small amount of elemental iodine to regenerate the new system where we previously had to fly a complete replacement unit," Sauer said.

This is the first year NASA has given a separate award for an invention that demonstrates commercial potential. The award is designed to complement the previously existing government invention award, by recognizing those inventions with commercial technology applications. The Regenerable Biocide Delivery Unit won in both categories.

The 1992 award winners were David Wolfe Thomas Goodwin and Tinh T. Trinh for their three-dimensional co-culture process.

Vaughan wins Engineer of the Year honors

Chet Vaughan, deputy director of the Engineering Directorate, recently received the National Society of Professional Engineers "Engineer of the Year Award" for NASA.

Vaughan was cited for "outstanding engineering accomplishments and management excellence" in the award nomination. As a result of Vaughan's selection as NASA Engineer of the Year, he also was eligible for the Federal Engineer of the Year award which recognizes outstanding individual engineers while acknowledging the accom-

plishments of all federal government engineers.

In nominating Vaughan for the award, NASA officials cited his work in developing, producing, testing and supporting the critical propulsion and power subsystems for the space shuttle. Vaughan was responsible for managing these high-energy systems where more than half of the possible orbiter failures which would result in loss of the vehicle are contained.

Vaughan also was the first person selected to serve in the one-

year rotational position of Chief Engineer for the Office of Space Flight at Headquarters in 1991. In that position, he was responsible for providing advice and engineering assessments on all aspects of NASA flight activities.

During his tenure as Chief Engineer, Vaughan and a review team from both Goddard and Marshall Space Flight Centers determined that an additional Tracking and Data Relay Satellite System for use during space station and shuttle docking maneuvers was not necessary,

translating into a \$300 million savings for the agency. Vaughan also chaired a Battery Review Board to examine serious ground and flight failures in nickel cadmium battery systems that support on-orbit satellites, providing direction for the use of secondary batteries in future NASA programs.

According to the award nomination signed by John Dailey, associate deputy administrator, Vaughan's "efforts have been instrumental in the success of the United States manned space flight program."



Chet Vaughan

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.

Moody Gardens — Discount tickets for two of three different attractions: \$9 Entertainment '94 Coupon Books — Bay Area/Galveston/Downtown or FM 1960/Downtown: \$30 each, \$1 off first book for civil servants. Gold C Books: \$8 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; Loew's Theater, \$4. Stamps: Book of 20, \$5.80.

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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 NASA badge or yellow EAA dependent badge. Classes tend to fill up two weeks in advance. Payment must be made in full, in exact change or by check, at the time of registration. No registration will be taken by telephone. For more information, call x30304.

EAA badges — Dependents and spouses may apply for photo identification badges from 6:30-9 p.m. Monday-Friday; 9-11 a.m., 1-3 p.m. and 6:30-9 p.m. Wednesdays; and 8 a.m.-4 p.m. Saturdays. Dependents must be between 16 and 23 years old.

Ballroom dancing — Classes meet from 7-9:30 p.m. Thursday nights. Cost is \$60 per couple for eight weeks. Beginner, beginner-intermediate, intermediate and advanced instruction is provided.

Weight safety — Required course for employees wishing to use the weight room is offered from 8-9:30 p.m. March 10. Pre-registration is required. Cost is \$5.

Defensive driving — Course is offered from 8:15 a.m.-3 p.m. Saturday. Next class is March 5. Cost is \$19.

Self-defense workshop — Free self-defense workshop is offered from 5-6 p.m. March 9.

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 and 6:15-8:15 p.m. Wednesdays. Black Belt class from 6-8 p.m. Fridays, requires instructor permission. Cost is \$25 per month.

Softball managers — Softball managers meeting is at 5 p.m. March 7 in Rms. 216, 217 and 218. Information pertaining to the upcoming season will be distributed.

Softball tournament — Men's Open C pre-season softball tournament will be held March 26-27. Registration deadline is 7 p.m. March 24. Cost is \$100.

Stamp club — JSC Stamp Club will meet from 7-9 p.m. every other Monday. For more information, call Dianne Kerkhove at 554-2764.

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

JSC

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 or fax ads accepted.

Property

Sale: Meadowgreen, 3-2-2, 1909 sq ft, \$112.5k. x39018 or 480-7610.

Sale/Lease: Friendswood, 3-2-3 dbl formals, lg den, new hi-eff A/C, ceiling fans. Gary, x31059 or 480-9716.

Rent: 2 rooms in CLC 3-2-2, El Dorado next to I-45 area, owner occupies master BR, \$400/mo + 2/3 util. 286-7516.

Sale: 1+ ac lot, Enchanted Valley Estates, NW, wooded, restricted, all util, concrete streets, \$15k. 333-4609.

Rent: Galveston beach house, wkly/wknd, sleeps 10. James, x36666 or 487-5730.

Sale: 2 lots, Lake Livingston, \$5k, owner will finance. James, x36666 or 487-5730.

Sale: Sagemont, 3-2-2, both formals, lg den, new roof/carpet. Ben, x34339 or 481-1439.

Sale: Taylorcrest, 4-3-2.5D, Southern Colonial, 3200+ sq ft, pool/spa, water view on cul-de-sac, island kitchen, 3 BR suites, balconies, art studio, \$290k, 4% co-op. Richard, x30271 or 326-4963.

Rent: Bolivar beach house, 11 mi from Galveston ferry, dly/wkly, 485-1730.

Lease: Univ Trace condo, 1 BR, study, W/D, cable hookup, ceiling fans, avail immediately. 488-2946.

Rent: Seabrook, room for professional roommate, 2 story, 4-2.5, fenced, private phone line avail, \$320/mo + 20% util. x35107.

Rent: Lake Travis cabin, private boat dock, CA/H, fully equipped, accom 8, \$325/wk or daily. 474-4922.

Rent: Galveston condo, furnished, sleeps 6, Seawall Blvd and 61st St, wknd/wkly/dly rates. Magdi Yassa, 333-4760 or 486-0788.

Rent: Wolf Creek, CO, ski house, sleeps 6, no smoking/pets, 100+ in. of packed powder. x30825 or 998-7372.

Rent: Winter Park, CO, ski condo, fully furnished, 2-2, sleeps 6. 488-4453.

Cars & Trucks

'85 Chevy PU, Silverado short bed, 47k mi, AT/PS/PB, AM/FM stereo, A/C, pwr locks/windows, bed mat, sec sys, new shocks/tires, \$5.5k. Bob, x37246 or 326-1510.

'88 Ford Thunderbird Turbo Coupe, 5 spd, 51k mi, 1 owner, non-smoker, blk/red, \$6.1k OBO, x33614 or 486-0193.

'86 Nissan 300 ZX, turbo/auto, blk, T-tops, leather int, AM/FM/cass, equalizer and pwr amp, pwr windows/seats, A/C, digital dash, ex cond. Richie, 996-7716.

'87 Ford Tempo, needs work. 338-1040.

'87 Ford Escort LX, good cond, 62k mi, very clean, \$4k. Elaine, x30118 or 334-1067.

'82 Dodge stakebed, DoT inspected, new tires, trans, batt, and sideboards. 485-7274 or vmail 639-3138.

'86 Pontiac Grand Am, 4 dr, auto, A/C, 87k mi, \$2k OBO. 486-0191.

'82 Escort wagon, blue, clean, runs good, \$500. x31143 or 488-4415.

'84 Cadillac Sedan deVille, ex cond, new trans, alternator, batt, \$2k. x39971.

'81 Corvette 350, 65k mi, runs good, gray w/tan int, needs paint, \$7k. 991-6503.

'92 Honda Accord DX, auto, 4 dr, A/C, stereo, 34k mi, ex cond, 100k mi warranty, \$12k OBO. 333-2490 or 240-7266.

'91 Nissan PU, king cab, auto, A/C, PS, stereo, ex cond, \$7.3k. John, 286-3975.

'87 Lincoln Town Car, 81k mi, clean, good cond, \$6.3k. 337-2777 or 337-4559.

'86 Ford Escort L, 4 dr, not running, \$350 OBO. Nelson, x38486 or 332-0746.

'84 Pontiac LE 6000, loaded, \$1.6k. Travis, 489-4766 or 280-2624.

'76 Ford Torino, needs minor maint, motor runs good, \$700 OBO. 332-7492.

'85 Mustang convertible, V6, fuel inj, all pwr, incl top, low mi. \$4295. X30017.

'82 Camaro, A/C, auto, 2.8L V6, AM/FM stereo/cass, brn/beige, very clean, ex cond, low mi, \$2.5k OBO. 991-5280.

Boats & Planes

'90 Welcraft 197 Eclipse, 4.3 hp Merc, bl/wht, cuddy cabin, AM/FM/cass, \$12.5k. Rebecca, x44737.

Catamaran, 16' Pringle w/trlr, ex cond, new sails and trampoline, \$700 OBO. x37549.

Chaparral 187, 140 hp Mercruiser, I/O, ss prop, electronics, ex cond, \$5.7k. x37954 or 481-1605.

SeaRay 225cc, 228 hp Mercruiser, new Alpha One I/O, VHF, color depth finder, ex cond, \$8.5k. Mark, x38013 or 992-4132.

US Yachts 22 ft sloop w/4.5 hp O/B, 2 sails, galley, sleeps 5, ex cond, \$5k. Russ, x45979 or 332-1769.

18' VIP Vision, 1.5 yrs old, 130 hp/OMC, I/O, trlr w/retractable tongue, all access, garaged, ex cond, \$9.9k OBO. Jennifer, x38668 or 286-0507.

Cycles

'94 Harley-Davidson Fat Boy, \$19.5k. x35107.

Honda MR-50cc, not running, \$30. Nelson, x38486 or 332-0746.

'83 Honda 650 Nighthawk, ex cond, low mi, new tires, \$2.5k. 480-3613.

Trade Team Fuji racing bike, 12 spd Suntour equip, ex cond, for comparable mountain bike. James, 282-3215 or 480-9448.

Audiovisual & Computers

Toshiba T5200, 386SX, 20 MHz w/coprocessor socket, 6 MB RAM, 200 MB HD, 2 serial/1 parallel, 1 RGB port for ext monitor, gas plasma monochrome display, 2 internal AT compatible slots, manuals, ex cond, \$750 OBO. Tan Tran, 777-7003.

Sony compact stereo, digital tuner, turntable, dual cassette deck, 5 disk CD carousel, speakers, \$350 for all. Fred, x30183 or 486-7159.

Technics CD player, ex cond, \$80. Debbie, x33038 or 332-0479.

Compaq Contura 4/25 laptop and case, 4/120MB, 32 bit, 25 MHz, int fax modem, 3.5 HFD, MS Windows, PFS, Window Works, mouse, batt, charger, \$1.5k. 333-7064.

2 EGA monitors, \$110 ea OBO. Allen, x47264 or 409-762-6823.

JSC

Today

Cafeteria menu — Special: tuna noodle casserole. Total Health: steamed salmon steak. Entrees: steamed salmon steak, roast beef, baked chicken, steamed fish, Reuben sandwich. Soup: seafood gumbo. Vegetables: French cut green beans, cauliflower with cheese, green peas, black-eyed peas.

Monday

Cafeteria menu — Special: breaded cutlet. Total Health: crispy baked chicken. 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

Cafeteria menu — Special: fried chicken. Total Health: vegetable lasagna. 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

Astronomy seminar — The JSC Astronomy Seminar will meet at noon March 9 in Bldg. 31, Rm. 129. For more information, call Al Jackson, 333-7679.

PSI meets — The Clear Lake/NASA Area chapter of Professional Secretaries International meets at 5:30 p.m. March 9 at the Holiday Inn on NASA Road 1. Marita Irmiter, an attorney, will discuss "Durable Power of Attorney and Living Wills." For additional information, contact Elaine Kemp, x30556 or Diana

Peterson, x30390.

Cafeteria menu — Special: stuffed bell pepper. Total Health: stuffed bell pepper with creole sauce. 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

Russian speakers — Practice Russian language skills from 11 a.m.-1 p.m. March 10 in the Bldg. 3 cafeteria. For more information, call Jack Bacon, x38725, or Amy Mendez, x38066.

Blood drive — Hernandez Engineering will host a blood drive from 8-11:30 a.m. and 1-2 p.m. at 17625 El Camino Real. For more information, call Christina Bastien, x39300.

Cafeteria menu — Special: barbecue smoked link. Total Health: roasted turkey breast. 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. Total Health: spaghetti noodles with turkey meat sauce. 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.

March 12

LPI lectures — The Lunar Planetary Institute public lecture series will

host Dr. Eugene Shoemaker discussing "Cosmic Bullets, Craters and Catastrophes" at 7 p.m. March 12 at the University of Houston Clear Lake's Bayou Theater.

March 16

Astronomy seminar — The JSC Astronomy Seminar will meet at noon March 16 in Bldg. 31, Rm. 129. Jim Oberg will speak on "Buying Moon Rocks and other Space Auction Stories." For more information, call Al Jackson, 333-7679.

March 17

NCMA Seminar — The Space City-Houston Chapter of the National Contract Managers Association presents an educational seminar on "Commercial, Environment and International Contracting: An Evolving Focus," at 8:15 a.m. March 17 at the University of Houston-Clear Lake. Cost is \$135 for members and \$185 for non-members. Registration deadline is March 7. For additional information, contact Jennifer Reynolds, 438-4621.

IEEE Symposium — The JSC Chapter of the Institute of Electrical and Electronics Engineers will co-sponsor the Joint Applications in Instrumentation Process and Computer Control symposium beginning at 8:30 a.m. March 17 at the University of Houston-Clear Lake. Cost is \$20. For registration and additional information, contact Vernon Bryant, 283-3770 or Ken Goodwin, x38244.

Russian speakers — Practice Russian language skills from 11 a.m.-1 p.m. March 17 in the Bldg. 3 cafeteria. For additional information, call Jack Bacon, x38725, or Amy Mendez, x38066.

x30072 or 286-2011.

Fish tanks and accessories, pkg deal, \$55; reel mower and bag, ex cond, \$50. Brian, x30147 or 286-2011.

Wooden porch swing w/chain, \$75. Eric, x31917 or 482-3662.

30" riding lawn mower, 11 hp, 8 spd, ex cond, \$575. Mark, x38013 or 992-4132.

GE wahsing machine, works fine but has sm water leak, \$25. 333-4609.

Hot tub w/cover, ex tub condition, needs motor, \$500. Jeff, 337-2784.

Delta cast iron table saw, carbide tip blade, ex cond, \$250 OBO. Dave, x35798 or 482-4374.

Up to 4 American Airlines group tickets, roundtrip, "open jaw" Dallas to London, 5-29-94, Paris to Dallas, 6/11/94, \$785/ticket. 486-5500.

Wood desk, \$100; 3 Pal personal alarms, \$20 ea; folding dog cage, 2' x 3', \$80. Faye, 480-1455.

Hamilton drafting table, 60" x 36", oak trestle base, iron protractor, new drawing surface, incl wood parallel bar w/acrylic edge, \$200. 645-5746.

Dog cage, 1 yr old, 19" x 24" x 21", \$20. 992-5745.

Simmons cherry crib, Graco playpen/swing/walker/highchair, car seats, crib sheets/comforter/dustuffle, blankets, toys, and boy's clothing from birth to 3t, two wooden aerobic benches and LP records. x32461.

10" GE color TV, old but works, \$10; refrig-style cooler, \$10; tall men's suits, like new, 41L; Smith-Corona manual typewriter, like new; Fisher Price high chair, \$40. Kelly, 996-8410.

Three shelf dolly, 2000 lb capacity, ex cond, was \$600, now \$200; baseball card vending machine, ex cond, was \$600, now \$200. George, 475-2132.

Full sz futon bed, ex cond, \$250; mountain bike, many new parts, \$100; 8' painter's ladder w/platform, \$75. George, 475-2132.

French Provincial desk and dresser; 6 drawer dresser/mirror; 6 amp battery charger; upright vacuum cleaner; floor polisher; 13" b&w TV; T199-4A; computer desk; bags of stuffed animals. Fred, 944-3523.

Neon Grand Prize beer sign; 10c Coke machine, runs, \$350. 335-6978.

Two mirrors, 3' x 8'; 2 beveled mirror strips, 4' x 8'; all mounting hardware, \$80 OBO. Rob, 486-1804 or 486-8740 x222.

Black stand w/dark glass door for 35" TV, like new, \$350 will consider other offers; X-ray film viewer on mobile stand w/shelf. Enrique, 991-0821.

Raleigh Beach Cruiser, 6 spd, \$150; softside Lifesupport qn sz waterbed, lifetime warranty, \$350; alloy rims for '87-'88 Maxima, \$75 for all; alloy rims for '92-'93 Honda Accord EX; organza wedding dress w/headpiece, \$400 OBO. Tamara, 282-4455.

Bauer Turbo hockey skates, never used, sz 10, \$50. x36309 or 474-9747.

Two Sherwood scuba tanks, like new, \$90 ea; 1 Dacor Microbrain dive computer, \$100; 2 RC model airplane kits, new in box, Spitfire and Focke Wulf, \$70 ea or \$130 both. Tim, x36370 or 859-8773.

Collection of over 50 collectable plates, various artists and series, inventory list avail, \$15 ea or 2 for \$25. Earl Rubenstein, 480-1998.

Miscellaneous

Smithy AT-300 lathe-mill-drill, less than 1 yr old, used very little, \$1350. 326-1946.

Authier Flash snow skis, 150cm, \$50; Heir-ling ski boots, ladies sz 5, \$25; blk stretch ski pants w/powder blue trim, ladies sz 8, \$40. Stacie, x41036 or 333-4577.

Stairmaster, ex cond, \$50. Michelle, 283-7545.

Super T10 4 spd trans from '80 Vette, fine spline, fits most GM, ex cond, \$375 OBO. 488-5546.

Yamaha speakers, 140W ea, \$75/pr; Prince tennis racket, \$10; Black & Decker, weeder, new, \$25; Sears weedeater, trigger feed, new, \$50; Murray lawn mower, new, \$120. Bob,

Atari 524 computer, monitor, printer, extra FD, accessories; Atari 800 computer, monitor, printer, game cartridges, modem, make offer. Steve, x37152 or 992-7049.

Database, FoxPro 2.5, DOS upgrade version, still in shrink-wrap, \$60. x45372.

GateWay computer, 386-33MHz, 8 MB RAM, 120 MB HD, tower, 15" crystal scan monitor, kybd, mouse, DOS/Windows, S/W, \$2150. 486-7111.

Lotus 1-2-3 rel. 4.0.1 for Windows and Lotus Write rel 2.0, plus documentation, still in shrink-wrap, \$200/both. 486-5500.

Macintosh IIfx, 20 MB RAM, 80 MB HD, Radius monitor, \$1.2k OBO. George, 743-2643 or 484-6295.

PC CD ROM software, ROM Material, \$10; WIN CD Professional, \$15. Mark, x30044.

Sherwood tuner, amp, and KLH speakers, \$75. Charlie, 488-4412.

Macintosh SE, 2 MB RAM, 20 MB HD, S/W, \$500. 335-2968 or 326-1293.

Panasonic SKP-2124 printer, 2 boxes of paper, spare ribbon, \$275. 681-4126.

NEC-286 computer, 640k RAM, 44 MB HD, 3.5" and 5.25" FDs, color monitor, kybd, S/W, \$600; Panasonic KXP-1180 printer, \$60. Earl Rubenstein, 480-1998.

Photographic

RCA Pro 8 video camera, accessories, used very little, \$450 OBO. 482-6879.

Nikon F-3 camera, Nikon lens, 50mm 1:1.8, 28mm 1:3.5, CPC lens 80-200 f4.0 macro, Nikon hot/shoe, Minolta flash, best offer over \$500. 326-1946.

Pentax ME Super Body, \$80; 50mm lens, \$20; 135mm lens, \$30; 300mm lens, \$85. Gregg, x31250.

Pets & Livestock

AKC registered Boston Terrier puppies, 3 female, 4 male, born 2/2/94. Mike, 489-4558 or vmail 639-3138.

Emu chicks and breeders. 482-0874.

AKC registered Siberian Husky, fem, 1.5 yrs old, blk/wht, blue eyes, medical records avail, \$150 OBO. 991-5280.

Boxer mix puppy, fem, blk, 1st shots, very friendly, free. Laurie, x35590 or 991-0821.

Household

Sect sofa/bed w/built in recliner/end tbl, \$400; Jensen 100 watt floor spkrs, \$100. Rebecca, x44737.

Kg sz waterbed w/mirrored headboard, built-in heater w/control box, will deliver in Clear Lake area, \$150 OBO. Snady, x37947.

Bassett, solid wood, walnut finish book shelves/entertainment center, \$200-\$500/unit. 869-5557.

Two new area rugs, 9' x 12' mauve and 4' x 6' blue, \$50 for both. x38339.

Setting Global Norms

STS-60 crew sets standard for cooperation

The crew patch for STS-60 came in two alphabets—English and Cyrillic—but were it not for the differences in language, there would have been little to differentiate the Russian crew member from his American counterparts.

Photographs from the eight-day flight show how the six astronauts worked together as a team, foreshadowing what President Bill Clinton told them will become "the norm of global cooperation in space."

Together, Commander Charlie Bolden, Pilot Ken Reightler, Payload Commander Franklin Chang-Diaz and Mission Specialists Jan Davis, Sergei Krikalev and Ron Sega conducted a wide range of biomedical and materials processing, including those of the Wake Shield Facility on *Discovery's* robot arm. They also deployed a German-built satellite and six spheres that will be used to calibrate space-junk tracking radars.

Clockwise from top left:

1) Sega floats on the aft flight deck as the remote manipulator system arm holds the Wake Shield Facility above *Discovery's* payload bay. He is co-principal investigator on the ultra-vacuum thin-film growth experiment developed by the University of Houston's Space Vacuum Epitaxy Center;

2) The six crew members squeeze through the tunnel that connected the shirt-sleeve environments of the space shuttle and the SPACEHAB module in its payload bay. Bolden is at upper right; clockwise from him are Sega, Davis, Chang-Diaz, Krikalev and Reightler;

3) Reightler processes biomedical samples in a centrifuge aboard the SPACEHAB module;

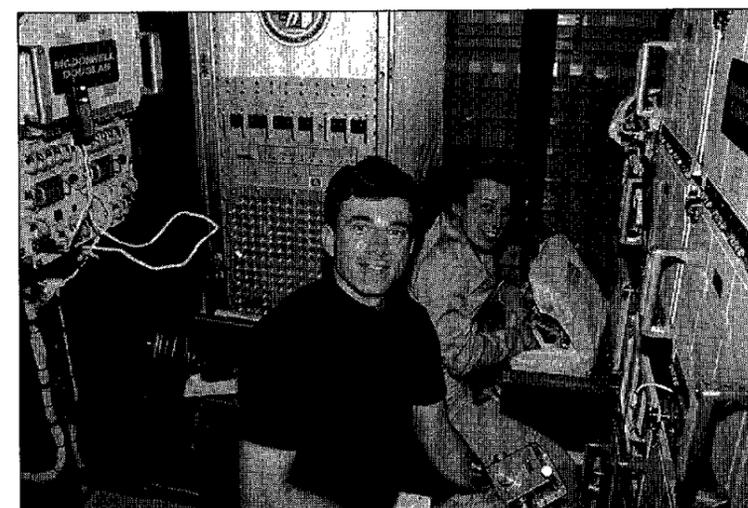
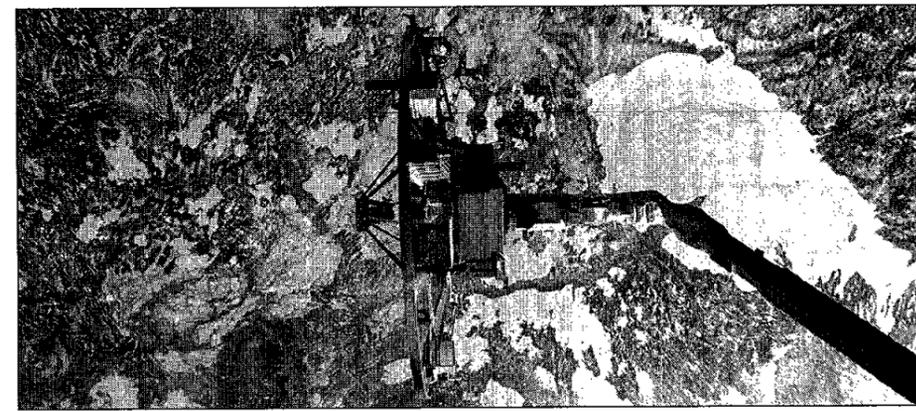
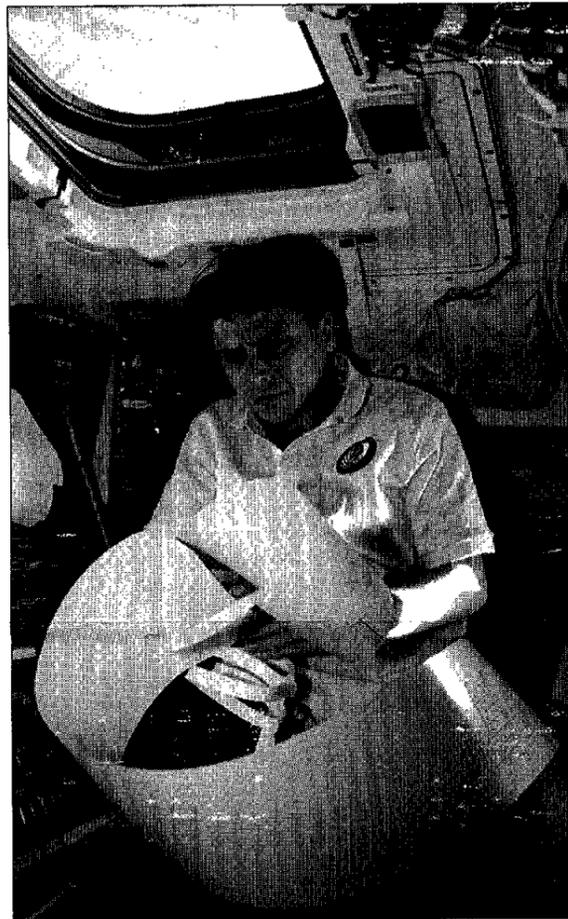
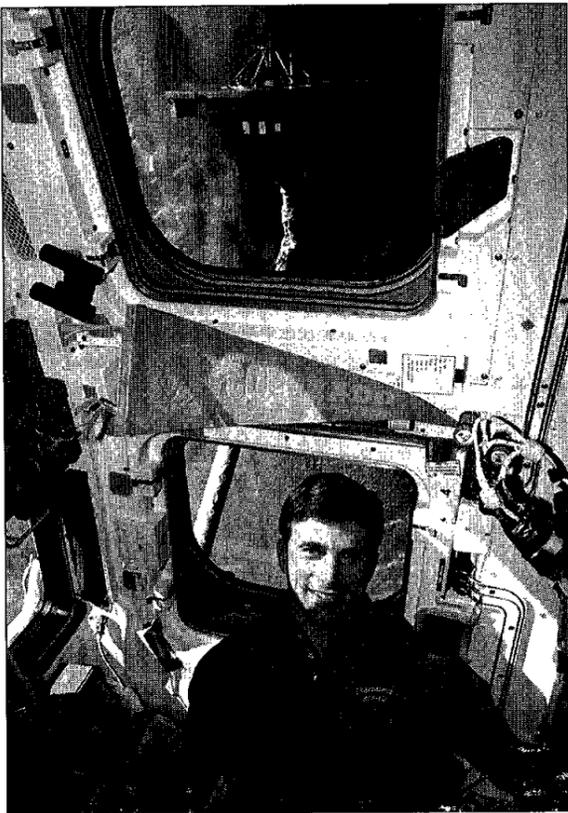
4) A wintry scene of Lake Winnipeg and the surrounding area of Manitoba, Canada, forms the backdrop for the Wake Shield Facility, firmly in the grasp of the Canadian-built robot arm;

5) On *Discovery's* aft flight deck, Krikalev prepares for one chore while performing another. Using the Shuttle Amateur Radio Experiment gear, he talks to students in Maine while holding a camcorder, which he used later to videotape activities of his crewmates;

6) Sega and Davis stow experiments and gear used in the SPACEHAB module as the crew prepares for a landing at Kennedy Space Center;

7) Using a lap-top computer, Davis monitors systems for the Commercial Protein Crystal Growth experiment; and

8) Chang-Diaz begins to organize what is believed to be among the longest mail messages in shuttle history. Though early shuttle flights could brag of longer teleprinted messages, the Thermal Imaging Printing System's day four correspondence was one of the longest in recent memory. The morning mail included discussions about issues affecting the myriad of payloads in *Discovery's* payload bay, in the SPACEHAB module and on the middeck. □



Center working to stretch maintenance dollars

McCright urges workers to help keep JSC attractive place to work

By Kelly Humphries

The turf will get longer between cuttings and edgings and office trash will be emptied less frequently as the everyday impact of tightening budgets becomes more obvious this spring.

Service reductions, changes and eliminations in the area of custodial, painting and grounds maintenance services are part of a centerwide effort to stretch its maintenance dollars and more effectively meet the agency's programmatic challenges, said Center Operations Director Grady McCright.

"I urge everyone to help weather

this fiscal storm by doing everything possible to conserve our resources and facilities by minimizing maintenance requirements," McCright said. "If we all do our part, we can help keep JSC an attractive place to work."

Inside, some of the more noticeable changes will be a reduction in trash pickup to Mondays, Wednesdays and Fridays, making it even more important that employees not leave food waste in their office trash cans, as odors, insects, and mice will become more prevalent where food waste is left. All food waste should be placed in trash recepta-

cles in the janitor's closet, which will be emptied daily.

In addition, custodians will no longer empty recyclable paper trays; employees must start dumping their paper trash as needed in the beige recycling carts in all buildings.

Floors will be buffed less frequently, as well, although custodians will continue to provide essential services needed to provide healthy, sanitary working conditions.

Interior office painting will be limited to essential corrosion control and safety-related concerns. Since

routine office repainting will no longer be performed, employees are asked again to refrain from using tape, tacks and other damaging hangers on walls and doors.

Outside, the grass will be mowed, edged and watered less often. Since there won't be enough manpower to continue hand watering areas without irrigation, any drought conditions in those areas will show up as diseased and dying turf.

Annual flowers will be replaced by perennials or eliminated altogether.

"Those of us who work here have always taken a great deal of pride

in the appearance of the Johnson Space Center," said Mike Scott, chief of the Special Purpose Maintenance Services Branch. "For those of us responsible for its maintenance, any degradation in that appearance comes as a 'hard pill to swallow.'

"However, it's a sign of the times," Scott added. "With increasingly shrinking budgets, we must purchase less manpower and materials. Inevitably, that equates to less maintenance. In the past few years, we have spread our maintenance dollars and personnel thinner and thinner. Now, we must cut services."

Talk to focus on infertility

A seminar focusing on the causes and treatments of infertility will be presented March 30 at the Gilruth Center.

The JSC Clinic is hosting the two-hour program which begins at 7 p.m. in Rm. 216 at the Gilruth. Dr. Vicki Schnell, a gynecologist and infertility specialist, will discuss the causes, medical evaluation and treatment of infertility.

It is estimated that more than 5,000,000 people nationwide are affected by infertility, although less than two percent of that number seek help. "Infertility affects so many aspects of your life," said Joyce Mason of the clinic.

There is no cost to attend the seminar which is open to JSC employees and contractors. Reservations are suggested and spouses are encouraged to attend the seminar together.

For additional information, contact the clinic at x37783.

HST crew to share award

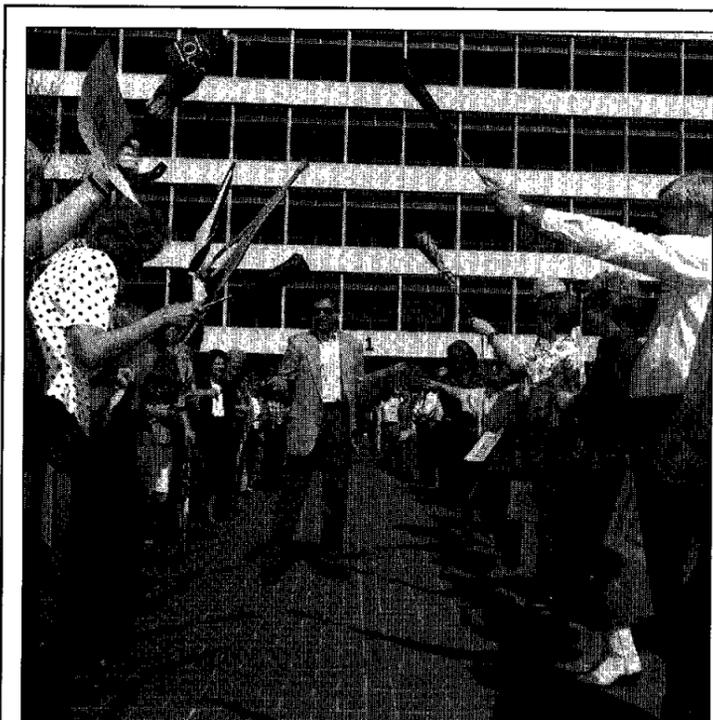
(Continued from Page 1)

handle construction and repair work in orbit."

The NASA College Scholarship Fund awards scholarships agency-wide to full-time students who are dependents of current or retired NASA employees and dependents of current reimbursable detailees to NASA.

Scholarships also may be awarded to full-time students who are dependents of NASA employees or reimbursable detailees who died while employed by NASA.

For information on qualifying or applying for a scholarship, contact Mary O'Connell, x39168 or the NASA College Scholarship Fund, Inc., AH12, Scholarship Committee.



JSC Photo by Jack Jacob

RETIRING IN STYLE — Bill Huffstetler, manager of the New Initiatives Office retired from NASA on Feb. 25. As he left Bldg. 1 that day, he received a final farewell salute from fellow employees. Huffstetler passed through a gauntlet of crossed umbrellas and brooms before being whisked away in a chauffeured limousine to start his retirement.

MCC open for viewing

The Mission Control Center viewing room will be open to JSC and contractor badged employees and their families during portions of the STS-62 mission.

Based on a Thursday launch, employees will be allowed to visit the MCC Friday from 11:30 a.m.-2:30 p.m. and 5-7 p.m. and on Sunday from 1-5 p.m.

The MCC also will be open from 11:30 a.m.-2:30 p.m. on March 9, from 1-5 p.m. March 12; 11:30 a.m.-2:30 p.m. March 14; and on March 16 from 11:30 a.m.-2:30 p.m. and from 5-7 p.m.

There will be no scheduled viewing hours on March 17 due to the planned landing. For the latest information, call x36765.

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.

Dates and Data submissions are due Wednesdays, eight working days before the desired date of publication.

Editor Kelly Humphries
Associate Editor Kari Fluegel
Associate Editor Eileen Hawley

'Total Health' lunch is a total success

Last August, a "Total Health" lunch entree was added to the menu at JSC's two cafeterias to offer a lower calorie, lower fat meal option for cafeteria patrons.

That program has been an unqualified success, according to a survey conducted by Larry Wier, health-related fitness director. "We are seeing an increase in cafeteria business since the addition of the Total Health lunch," Wier said.

Survey results indicate the existence of a small but significant number of new cafeteria patrons as a result of the healthy lunch option, *total health* and yet other survey

participants said they eat at the cafeteria more frequently since they now have the option of a Total Health entree. "There were several interesting findings in that survey," Wier said, "including the number of people who routinely have a 'brown bag' lunch at their desks."

More than 40 percent of JSC employees regularly eat lunch at their desks. As a result, the Total Health lunch program is considering adding a "healthy sack lunch" to its repertoire. Dietitian Cindy Yuan is

designing menus for these meals which will be pre-packaged for employees to pick up and take back to their offices. The sack lunches will meet the Total Health criteria for calorie and fat content and may range from a sandwich to yogurt and carrot sticks.

"For the most part, employees seem to appreciate the option of a healthy lunch entree," Wier said.

"The only real complaint seems to be with the price of the entree." At an average cost of \$4.25, the Total Health lunch remains less expensive than most restaurant entrees, but Wier said the cafeteria is considering an option to sell Total Health lunch items a la carte. If that happens, diners could build a custom meal from a variety of Total Health options.

According to Wier, the survey and the increased business at the cafeteria indicate most employees are enjoying the diversity of the Total Health menu. "We are continually working to better the health of our employees," Wier said, "and this program helps them reach their goal of maintaining healthy eating habits."

Register for engineering courses

In cooperation with the Cullen School of Engineering at the University of Houston, JSC is again offering graduate engineering courses at the Clear Lake campus for the summer and fall 1994 terms.

As a convenience to JSC employees and contractors, on-site registration for these, and all other UH engineering courses will be held from 10:30 a.m.-2 p.m. on April 29 in the Bldg. 45 lobby. Registration forms are available in the Human Resources Development Branch, in Bldg. 45, Rm. 146. JSC employees may submit a completed Form 75 as

payment for their engineering courses. Contractor employees will receive an invoice from the University.

Admission applications for the university are currently available in Bldg. 45, Rm. 146. All applicants for admission and all new students must bring their undergraduate transcripts with the degree posted and new students are reminded that only six hours taken as a post-baccalaureate may be transferred for graduate credit.

For additional information, contact Paige Maultsby at ext. 33075.

JSC joins community effort to support displaced workers

By Eileen Hawley

Throughout the Clear Lake area, businesses and civic groups, including JSC, are working together to support the Aerospace Job Resource Center in its efforts to assist unemployed professionals in the Clear Lake area.

The current focus is on a job fair to be held March 18 at the University of Houston-Clear Lake. "This job fair is a response to the most recent, larger layoffs in our area," said Linda Brown, job development specialist at the resource center located on the campus.

The center, which opened Dec. 15, provides support services and training seminars to dislocated aerospace workers to assist them in getting gainful employment as soon as possible. "We are doing what we can to help the AJRC succeed," said Mary Allen of the Employee Services Section.

That support includes donating excess equipment for use in the center's computer lab and the loan of two additional computer work

stations to be used during the job fair for registration and data management.

According to Director of Human Resources, Harv Hartman, JSC has played an active role in planning the resource center in concert with the Texas Employment Commission and other agencies. "We have been very interested in helping our partners find positions for people that have been terminated," Hartman said.

"We would like to retain that talent pool in the bay area to the maximum extent possible. We are encouraged by the quality of the work done at the resource center and believe its approach to the situation provides the highest likelihood of finding meaningful jobs" for displaced workers within the Clear Lake area.

The "On Trac" job fair—which stands for Offering New Technology Resources and Careers—runs from 11 a.m.-7 p.m. March 18 in Atrium II in the Bayou Building at UH-Clear Lake.

Brown anticipates a minimum of 40 companies will participate in the event targeting companies in the computer, biomedical and environmental fields. "These companies offer obvious connections to the types of skills the workers in this area possess," Brown said. Invitations to participate in the job fair were sent to 1,000 local companies with the goal of keeping the displaced workers employed in the Houston area.

"These people have the skills and knowledge to help local industry grow and expand," Brown said. "The greatest number of job opportunities we're seeing at this point, though, are coming from outside of this area. Some of the companies we expect include Perot Systems from Dallas, Intermetics from Angleton, EnerSoft, I-Net, Grumman, Continental Airlines Technical Division and a number of financial investment and life insurance companies."

But businesses are not the only interests to be represented at the job fair. Community resource orga-

nizations also will be in evidence. "Both the United Way and Interfaith Caring Ministries will be at the job fair to answer questions about resources available to the unemployed," Brown said. "And many local churches will be there to talk about the support and networking groups they offer."

In addition to meeting with prospective employers and learning about the community resources available, job fair attendees may attend several seminars scheduled throughout the day. Judy Price, Director of the Texas Employment Commission's Dislocated Worker Program will discuss "The Dislocated Worker Program: What We Can Do For You" at 11:30 a.m. and 3 p.m.

John Truitt's Telesearch - Job Finding Skills presentation may be seen at 11:30 a.m., 12:30 p.m., 2:30 p.m. and 5:30 p.m. This seminar focuses on refining job seeking skills and techniques.

At 11:30 a.m. and 12:30 p.m., Roberta Skebo of the UH-Clear

Lake Small Business Development Center will speak on "Issues to Address in Starting a Business." Dr. Jill Fabricant, director of the NASA Technology Commercialization Group will discuss the resources it can provide for new and established businesses beginning at 2 p.m.

Also scheduled are presentations by AJRC supporter George Ulrich, discussing dual technology at 1 p.m., and Randy Goldsmith of the Mid-Continent Technology Transfer Office will discuss "The Innovation Process: Idea to Market" at 3:30 p.m.

Because the job fair is a community effort, anyone who is out of work or who may soon be laid off, is invited to attend. However, the event is geared toward technical and professional careers, not retail or service-oriented opportunities. With job fair hours extending to 7 p.m., Brown hopes that those people who are currently employed but whose situation may be tenuous, will take advantage of the evening hours to visit the fair.