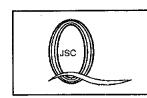
Lyndon B. Johnson Space Center Houston, Texas



The fundamentals

STS-52 recorded a wealth of data through USMP-1 and commercially sponsored experiments. Story on Page 3.



Total video

A series of videos on W. Edwards Deming's ideas about quality and productivity is coming to JSC soon. Photo on Page 4.

Space News Roundup

Vol. 31 November 6, 1992 No.43

Try another gate to avoid traffic jam

Saturn Lane improvements necessitate flexibility, patience

JSC security officials are asking employees to exercise patience and flexibility in dealing with traffic congestion at the intersection of Saturn Lane and Second Street, particularly in the mornings.

Although JSC turned over jurisdiction to the City of Houston just before Metro began its massive construction project, JSC officials are talking with local authorities to try to ease the congestion.

The electronic loop system that automatically adjusts traffic priori-

ties has been disabled because of the construction and is not expected to be reactivated until the work is completed after the first of the year. In the meantime, employees are urged to use alternate entrances to the site.

Less congested access may be available at the main gate on NASA Road 1, open 24 hours a day; at the NASA Road 1 and Third Street entrance, open from 6:45 a.m. to 6 p.m.; at the Space Center Boulevard and Avenue B east

entrance, open from 6:45 a.m. to 6 p.m.; and at the Space Center Boulevard and Avenue B west entrance, open from 5:45 a.m. to 8 p.m.

In the near future, the old Avenue E between Second and Third Streets will be closed and the new Avenue E just north of Bldg. 110 will be opened. This could cause additional congestion in the afternoons for outbound traffic if employees do not take advantage of other available gates.



JSC Photo by Benny Benav

Traffic backs up at Saturn Lane and Second Street as JSC employees head for work Tuesday morning.

Goldin names three to high level positions

NASA Administrator Daniel Goldin has named three people to fill high level positions, two of them after a nationwide search.

Charles Pellerin becomes associate deputy administrator for strategic planning, John Dailey joins NASA as associate deputy administrator and Ralph Thomas becomes the first assistant administrator for small and disadvantaged business utilization.

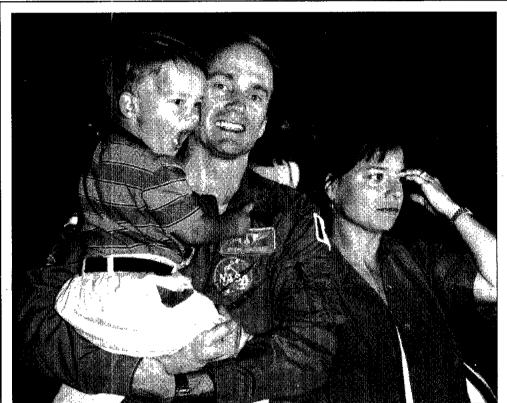
Pellerin, who will be responsible for creating a strategic plan to implement the agency's vision, mission and values, was most recently the deputy associate administrator for safety and mission quality and previously had been director of the Astrophysics Division. Dailey and Thomas were selected after a nation-wide search and review.

Dailey, who will plan and manage the institutional operations of NASA, was most recently the assistant commandant of the Marine Corps.

Thomas, who was executive director of the National Association of Minority Contractors, will be the first administrator of what only recently was a division. Goldin said the new office will ensure that NASA reflects the full diversity of America and that Thomas will "spearhead a determined effort to see that small and minority-owned businesses play a significant role in America's civil space and aeronautics programs."

Pellerin, who has been with NASA for some 25 years, first came to NASA Headquarters in 1975 to assist in the planning for shuttle utilization. He later managed the integration of payloads for the shuttle. In 1982, he moved to the Astrophysics Division, where he helped initiate a series of astrophysics telescopes called the "Great Observatories."

Dailey, who retired from the Marine
Please see GOLDIN Page 4



JSC Photo by Mark Sowa

Payload Specialist Steve MacLean is greeted by his 2-year-old son, Jean-Philippe, and wife, Nadine, during Sunday's welcome home ceremony at Ellington Field.

Crew proud, but glad to be home

COLUMBIA

By Kelly Humphries

The crew of the Space Shuttle Columbia

told friends, family and coworkers who gathered Sunday night at Ellington Field that their just-completed flight was anything but boring.

Rainy weather cleared up for the homecoming ceremony, which followed *Columbia*'s 8:05 a.m. CST Sunday landing at Kennedy Space Center's Shuttle Landing Facility by about 12 hours. and the crew arrived back home in Houston shortly after 8 p.m. All told, the crew spent 9 days, 20 hours, 56 minutes conducting a wide range of science experiments.

wide range of science experiments in orbit.

"We were not bored, we were working

pretty hard," said Commander Jim Wetherbee. "Shep (Mission Specialist Bill Shepherd) would be down there in the boiler

room shoveling coal as fast as he could. He had a CVTE (Crystals by Vapor Transport) experiment with a computer up on the airlock door and he's be monitoring me in the LBNP (Lower Body Negative Pressure device) and making entries into another computer with the other hand and sliding over and doing something with this experiment. It was pretty amazing to watch — and everybody was doing the same thing."

"The best part about it is working with the Please see **STS-52**, Page 4

Discovery rolls to pad on Sunday

By James Hartsfield

With *Columbia* home, attention at the Kennedy Space Center is now focused on *Discovery*, which is scheduled to be moved to Launch Pad 39A early Sunday.

Discovery was rolled from its processing hangar to the Vehicle Assembly Bldg, to be attached to the fuel

the Vehicle Assembly Bldg. to be tank and solid rockets for STS-53 Tuesday morning. It was hoisted vertical and attached in place Wednesday. Today, technicians are making a final check of electrical and mechanical connections between the solid rockets, fuel tank and spacecraft.

The crew of STS-53 — Commander Dave Walker, Pilot Bob Cabana, and Mission Specialists Guy Bluford, Jim Voss and Rich



DISCOVERY

Clifford — will travel to KSC Thursday for a dress rehearsal countdown aboard *Discovery*. STS-53, a Department of Defense mission, is currently targeted for a launch during the first week of December, perhaps as early as Dec. 2. Shuttle managers are scheduled to meet for a final review of mission preparations Nov. 19.

Elsewhere at KSC, the fuel tank for STS-54, currently targeted for a mid-January 1993 launch, was attached to the twin solid rockets this week. Endeavour is scheduled to be rolled out of its hangar Nov. 20 to be lifted vertical and attached to them. This week, the STS-54 cargo, a NASA Tracking and Data Relay Satellite and inertial upper stage booster, was loaded into a protective payload canister to await loading aboard Endeavour once it moves to the launch pad around Dec. 1. The STS-54 crew — Commander John Casper, Pilot Don McMonagle, and Mission Specialists Greg Harbaugh, Mario Runco Jr. and Susan Helms — will travel to KSC this weekend to inspect Endeavour's cargo bay.

Following landing last weekend, *Columbia* has been rolled to its processing hangar where experiments are being unloaded.

NASA adds veterinarian to SLS-2 crew

NASA has selected veterinarian Martin J. Fettman as the prime payload specialist for the second Spacelab Life Sciences mission set for launch in August 1993.

"NASA's series of SLS missions play a central role in our program of space biomedical research," said Dr. Lennard Fisk, associate administrator for the space science and applications. "The experiments that Dr. Fettman and his fellow SLS-2 crew members conduct will give us valuable information on how living and working in space affects the human body."

Fettman, a professor in the Department of Pathology in Colorado State University's College of Veterinary Medicine, will join the previously named STS- 58 crew consisting of Commander John Blaha, Pilot Richard Searfoss, Payload Commander Rhea Seddon and Mission Specialists Bill McArthur; Shannon Lucid and David Wolfe.

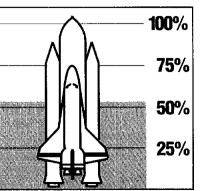
Jay Buckey, M.D., assistant professor at the University of Texas Southwestern Medical Center in Dallas, and Laurence Young, Sc.D., professor of aeronautics and astronautics at Massachusetts Institute of Technology, will serve as backup payload specialists and primary communicators with the payload crew during the 13-day mission.

SLS-2 is the second in a series of life sciences flights. In June, SLS-1 provided an opportunity for scientists to study the effects of weightlessness in a comprehensive inter-

related fashion using both human and animal subjects.

Most of the experiments assigned to SLS-2 are extensions of the data collection started on SLS-1. A total of 14 experiments will be flown, concentrating on the cardiovascular/cardiopulmonary systems, neuroscience, regulatory physiology and the musculoskeletal system.

Several NASA centers and organizations are involved in the development of the SLS-2 payload. Human experiments are being developed by the Life Sciences Project Division at JSC. Gary McCollum is program manager, and Dr. Frank Sulzman is program scientist. Dr. Howard Schneider is mission scientist, and Kathryn Newkirk is mission manager.



1992 GOAL: \$440,000



ISD worker wins first pair of CFC airline tickets

The winner of the first pair of Combined Federal Campaign airline tickets to anywhere in the continental U.S. went to Anne Modisette of the Information Systems Directorate.

Two more names will be drawn from a hopper containing the names of employees who have decided to contribute 1-hour's pay or more a month to the CFC. The tickets are provided at no cost to JSC by Continental Airlines.

So far, JSC employees have contributed more than \$223,000, or 53 percent of the \$440,000 goal. This year's CFC ends Nov. 10.

Ticket Window

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

Texas Renaissance Festival (9 a.m.-6 p.m. weekends through Nov. 15): adult, \$9.25; child (5-12): \$5.55.

Space Center Houston — Discount tickets available: adult, \$7.50; child (3-11)

Metro tickets — Passes, books and single tickets available.

Movie discounts: General Cinema, \$4; AMC Theater, \$3.75; Loews Theater, \$4

Entertainment '93 coupon books, stamps, Walt Disney Club memberships

Filruth Center News

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

Weight Safety — Required course for employees wishing to use the Gilruth weight room is offered from 8-9:30 p.m. Nov. 19. Pre-registration is required; cost

Defensive driving — Course is offered from 8 a.m.-5 p.m. Dec. 12. Cost is

Aerobics — High/low-impact classes meet 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. Tuesdays and Thursdays, Cost is \$24.

Bench aerobics - Class meets from 5:16-6:15 p.m. Mondays and Wednesdays. Cost is \$32 for eight weeks; participants must provide their own

Aikido — Martial arts class meets Tuesdays from 6:15-8 p.m. Cost is \$15 per month.

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

Country and western dance — Beginning class will meet from 7-8:30 p.m. Mondays for six weeks beginning Nov. 2. Intermediate class meets from 8:30-10 p.m. Mondays. Cost is \$20 per couple.

Flag football — Men's flag football registration will be at 7 a.m. Nov. 9 at the Gilruth. Mixed league sign-ups will be at 7 a.m. Nov. 10.

Volleyball — Winter league volleyball registration will be at 7 a.m. Dec. 8-9 at the Gilruth. Mixed C and women's leagues will sign up on Dec. 8. Mixed "B" and men's leagues will sign up Dec. 9.

Basketball — Winter league basketball registration will be at 7 a.m. Dec. 10 at

Dates & Data

Today

PSI meets — The Clear Lake/ NASA Area Chapter of Professional Secretaries International will meet at 5:30 p.m. Nov. 6 at the Holiday Inn on NASA Road 1. Earl Hatcher, executive director of the S.E.A.R.C.H. Homeless Project, will speak. For reservations or more information, call Bonnie House at 676-3764.

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

Saturday

Fuzzy logic — The Fuzzy Logic and Neural Networks Symposium will meet from 8:30-5 p.m. Nov. 7 at the South Shore Harbour Resort and Conference Center. For more information, call Troy Henson at

Monday

NSS meets — The Clear Lake Area Chapter for the National Space Society will meet at 7:30 p.m. Nov. 9 at the Gilruth Center, Rm. 222. Discussion will center on educating the public about the Space Exploration Initiative. For more information, call Marianne Dyson at 486-4747.

Cafeteria menu — Special: meatballs and spaghetti. Entrees: wieners and beans, round steak with hash browns. Soup: chicken noodle. Vegetables: okra and tomatoes, carrots, whipped potatoes.

Tuesday

Lions meet — The Bay Area Noon Lions Club will meet at noon Nov. 10 at the Days Inn Hotel, 2021 NASA Road 1. For more information, call Doug Strahm at 286-8138.

Cafeteria menu - Special: fried chicken. Entrees: beef stew, shrimp creole, sweet and sour pork chop with fried rice. Soup: beef and barley. Vegetables: stewed tomatoes, mixed vegetables, broccoli.

Wednesday

Cafeteria menu — Special: Swiss steak. Entrees: fried perch, New England dinner. Soup: seafood gumbo. Vegetables: Italian green beans, cabbage, carrots.

Thursday

AIAA meets — The American Institute of Aeronautics and Astronautics Houston Section will meet at 5:30 p.m. Nov. 12 in the Gilruth Center. Bob Young, president of Lockheed Corp.'s Technology Services Group, will discuss "Quality Trends in the Aerospace Industry. Cost is \$9 for members, \$10 for non members and \$8 for students. Reservations are due at noon Nov. 9; call x31350, 333-6064, 283-4214 or 282-3160.

Technical meeting — The AIAA's Guidance, Navigation and Flight Control Technical Committee will meet at 11:45 a.m. Nov. 12 at the Gilruth Center. McDonnell Douglas' Jim Treece will present an "ASA Simulation Development System Overview." For more information, call David Clark at 332-2484, or Rob Carmody at 283-4101.

SSQ meets — The Society for Software Quality will meet at 5:30 p.m. Nov. 12 at the Days Inn on NASA Road 1. Rockwell's Glynn Lunney will discuss "Software Quality in the Manned Space Program." For more information, call Felix Balderas at x31945.

Cafeteria menu — Special: stuffed bell pepper. Entrees: turkey and dressing, enchiladas with chili. wieners and baked beans. Soup: cream of chicken. Vegetables: zucchini squash, English peas, rice.

Nov. 13

Health Fair — The JSC Human Resources Office will sponsor a Health Fair from 9 a.m.-4 p.m. Nov. 13 in the Gilruth Center ballroom. Health care representatives will present their 1993 benefit packages to assist employees in making openseason changes. Open season runs from Nov. 9-Dec. 14. For more information, call x32681.

Cafeteria menu - Special: Salisbury steak. Entrees: baked scrod, broiled chicken with peach half. Soup: seafood gumbo. Vegetables: cauliflower au gratin, mixed vegetables, buttered cabbage, whipped potatoes.

Nov. 16

STS-52 briefing — The crew of STS-52 will brief employees on its recent mission at 1 p.m. Nov. 16 in Teague Auditorium. All employees are encouraged to attend as their work loads permit.

Nov. 18

CLANG meets - The Clear Lake Area Network Group will meet at 7 p.m. Nov. 18 at the South Shore Harbour Country Club. David Moore of David Systems will discuss Simple Network Management Protocol. Cost is \$12 for members, \$13 for non members. Reservations are due by noon Nov. 13; call Pat Adams at 338-5807.

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 AP3, or deliver them to the deposit box outside Rm. 147 in Bldg. 2. No phone or fax ads accepted.

Property

Sale: Lake Travis, oversized lot in Lago

Vista resort, make offer. 482-7093. Rent: Egret Bay, 2-2, FPL, balcony, all appl, icemaker, 2 fans, W/D, new paint/carpet, avail 11-1, \$550/mo. + dep. 286-7219.

Rent: Nassau Bay, TH, 2-2.5-2cp, tiled patio, FPL, remodeled kitchen, W/D, \$750/mo. + dep. 333-5056.

Lease: CL, 2-2.5-2 condo, overlooks marina, W/D, attached balconies/patio, refrig, security gates, \$875/mo. 474-4922.

Lease: CL, 2-1 condo, new carpet/paint, FPL, W/D conn, all appl, \$495/mo. 486-0315. Sale: Countryside, 3-2.5-2A, 2 story, lg corner lot, cov deck, all BR up, int util rm, CCISD, \$65.9K. 554-7623.

Sale: Sageglen, 4-2.5-2, 3007 sq ft, corner lot, 2 story, circular staircase, 2 wet bars, blk paneled gameroom, storm windows, solar screens sec sys, \$139.9K. x37760 or 481-4190. Sale: Sageglen, 4-2-2, 2154 sq ft, cathedral

ceiling, new carpet, track lights, wet bar, fans, security sys, \$82.4K. x37760 or 481-4190. Sale: Friendswood/Wedgewood Village

2-2, lg living rm, lg master BR, FPL, pecan/oak trees. 482-6236.

Rent: Univ Trace condo, 1 BR/study, W/D, DW. fans. cable hookup, all elec, avail imediately, \$475/mo. 488-2946.

Rent: timeshare condo anywhere in the world, \$575/wk. 282-3339 or 286-8417.

Rent: Baywind II condo, 2-2, new carpet/lanolium/paint, no pets, no smokers, \$525/mo. 486-8551. Lease: 3-2-2, hdwd floors, FPL, fans, Ig

master BR, hot tub, deck, fenced, pets ok, \$950/mo. 326-1155. Sale: LaPorte, 3-2.5-2, 1.5 story, formal din-

ing, lg deck w/hot tub, catheral ceilings in master BR/LR, \$65.5K. 283-5858 or 470-8330. Rent: Galv condo, furn, sleeps 6, Seawall &

61st, wknd/wkly/daily. Magdi Yassa, 333-4760 or 486-0788. Sale: Dickinson Bayou, .738 acres, 3-2.5-2,

pool, sec sys, water softner, 100 yr old oak trees, x34354 or 337-1640. Lease: Green Acres (Webster), 3-2-1a, lg open living area, Ig fenced yard, avail mid

Dec. \$950/mo. w/equal dep. 482-1685. Sale: CL Shores, 3-2-3, 2 story brick, boat slip, \$129K. 538-1849. Sale: CL Shores, 5-2-study, family, dining, 2

car gar, 100 x 100 corner lot, \$89K. 334-2434. Sale: CLC, 1-1 condo, W/D, refrig, alarm, FPL, owner moving, \$26.9K OBO. 280-9740. Sale: SW Houston, 2-2 condo, W/D, refrig, lg patio, FPL, \$29.9K. 280-9740.

Cars & Trucks

77 Gran Prix, new eng ('91), new trans ('90), new alternator, starter, radiator, master

cylinder, \$1K OBO. David, 554-5514 or 282-

'83 Honda Accord hatchback, blue, one owner, ex cond, 69K mi. Susan, 486-8865 '86 Toyota Celica, new tires/batt/brakes, \$4.4K, 337-4990.

'85 Pontiac 6000LE, 4 dr, all pwr, cruise, AC, ex int, \$2.5K. 943-5416 or 992-3022.

'89 Toyota PU, metallic blue, tinted windows, bedliner, alarm sys, 4 spd, 50K mi, stereo/cass, \$6.3K negotiable. 333-8047 or 286-7046.

Chrysler Lebaron Coupe, red, auto, alarm, 33K mi, 2.3L eng, cruise, \$8.5K negotiable. 333-8047 or 286-7046.

'78 Porsche 928, brwn w/leather int, auto, ex cond, 75K mi, \$8.5K OBO. Bill, x39980. '86 Pontiac Grand AM, V6, auto, 4 dr. tilt, cruise, new AC comp, \$3.4K. Jeri, 333-7552.

'91 Pontiac Grand AM LE, 4 dr, air, AM/FM/ cass, auto, one owner, ex cond, \$7.9K. 447-4922. '85 Sunline Travel camper, self contained.

AC, heater, 13' in length, sleeps 3, ex cond, \$3.8K. Doug, x39304. '82 Pontiac Bonneville, V6, 4 dr, air, AM/FM, tilt, cruise, 100K mi, runs good,

\$1.1K. Doug, x33399. '86 Chrysler Laser, \$1.5K. 856-0356.

'83 Olds Cutlass, 4 dr. \$800, 471-4100.

85 Mustang GT, t-tops, good int, ex mech, \$3.5K. Bill, x34455 or 280-0060.

'86 Honda Accord LXI, 4 dr, charcoal grey, AC, stereo/cass, moonroof, 5 spd, ex cond, 1

'91 Camaro RS, wht, stereo, \$9.2K OBO. 487-2383. '85 Chevy Corvette, auto, new saddle int,

new 16" tires, 69K mi, digital dash, ex cond. x38785 or 409-948-4887. '85 Isuzu Impulse, cold AC, AM/FM stereo, pwl. cruise, 5 spd. 100K mi, runs great, \$2.2K

Leonard, 922-6484. '83 Honda Accord LX hatchback, one owner, 69K mil, ex cond, \$1950. 486-8865. '88 Ford Escort GT, low mi, AC, PS/PB,

good cond, \$4.8K. 332-0015. '90 Escort GT, 5 spd, 3 dr, wht, tint windows, AC, cruise, tilt, AM/FM/cass, under 25K mi, ex cond, \$6.4K. 484-9582.

'90 Nissan Maxima SE, maroon, base stereo, elec sunroof, auto, ex cond, 27K mi w/extended warr, \$15.5K, Jan, x32896 or 538-1443.

'76 BMW 2002, rebuilt eng, tint, AC, sunroof, wht w/blue int, good cond, \$3.5K OBO; '88 Dodge Grand Caravan LE, blk cherry & wood grain, 3.0L. V6, auto, AC, loaded, 48K mi, ex cond, \$9.5K. George, x35398 or 474-7021.

'83 Chevy Silverado PU, diesel, new paint, int, runs good, \$2.2K. Kim, x32787 or 474-5863.

Boats & Planes

Shortboard Diamond Head, 9'6", 115 liters w/foot & fin, \$150, Steve, 333-7819.

'84 17' Mako, center console boat, '84 115 Evinrude, low hours, kept in storage, good cond, \$4.5K. Sonny, 538-3165.

'86 Sunrunner 230 EXP, 260 Volvo, aft cabin, sharepower trim tabs, VHF, Hummingbird, elec/Akohal stove, marine head, dual bat, ss prop, bimini and camper top, 300 hrs, \$15.3K. Jan, x32896 or 538-1443.

'80 Honda 750cc custom, looks and runs

good, \$650. Bill, x34455 or 280-0060. Go Cart, 3.5 hp, dbl seat, \$150. Steve,

Raleigh Super Course road bike, \$180.

Audiovisual & Computers

2 mini mixers, 8 in 2 out stereo, \$65/ea; Roland D-50 w/PG1000 programmer, \$900. Dave, x38115 or 997-2573.

Apple IIe sys, \$100; Apple 11 GS, RBG moni, stereo spkrs, printer, \$900; 286 PC motherboard, \$80; Yamaha Clavinova musical kybd, \$800; all prices negotiable. Ken,

Hewlett Packard relics, HP67 owners pkg, no calculator, w/Chemical Eng Pac 1, Medical Pac 1, Navigation Pac 1, free. Trebes, x37215.

Macintosh portable, non backlit, 2 MB RAM 40 MB HD, case, pwr supply, \$700; other Mac software avail. Jim, 335-2539 or 474-2368. MS Powerpoint for Windows, Ver 3.0

w/manuals, was \$395, now \$100. 992-1466. 2 Motorola, FM, 2-way mobile radios, low band, 100w ea., all cables, antennas, spkrs, microphones, control heads, wiring, \$150 for

both sets. Howie, 482-8354 or 282-3841. Atari Mega ST-4 w/color moni, 4 MB RAM, PC-ditto II, IBM emulator installed, runs Atari and IBM sw, \$575; Discovery cartridge, copies any protected 720K FD, \$85; Zoom 2400 baud ext modem w/error corr & compression. 482-8354 or 282-3841.

286 IBM compatible, 1 MB RAM, 3.5 & 5.25 FD, 20 MB HD, moni, Hayes int smart modem, mouse, sw, \$610; coprocessor, \$50. Jorge, 649-4058.

Photographic

Vivitar series 1 zoom lens 70-210mm f 2.8 w/macro for Minolta, \$150. John Erickson, 335-4278 or 488-1901.

Pets & Livestock

Mini-lop and fuzzy top rabbits, Gailo, 554-Tennessee walking horse, 12 yr old mare.

280-2280 or 409-925-2213.

Musical Instruments

Elec kybd w/cartridges, stool, books, \$250. 488-6917

Gulbrausen console piano, dk wood, ex tone, \$550. Bob, x33705 or 482-0755. Buffet E11 B-flat clarinet, \$375, 333-2830.

Piano, upright, White Co., Ig walnut finish, \$800. x33481 or 996-8682.

Sleeper couch, single sz, ex cond, \$150; tree, silk ficus, 6', \$30; storage unit, dark wood finish, \$110. 333-9733.

Full sz walnut platform bed w/hard foam matt, side table, sheets, comforter, \$40; 3 pc modular sofa, It beige, can be arranged as 84" couch or L-shaped corner unit, \$50. Chris. x37159 or 488-5706. Bwrn solid wood desk w/lamp & chair;

compound bow w/arrows & case, 482-8490. Kg sz bed w/hardwood frame trimmed

w/brass, ex cond, spread, pillows, sheets, matt cov, \$225; keg refrig, 20 cu ft, w/icemaker, incl empty keg, gass bottle, all hoses,

\$275. x39282 or 335-0641.

Blk/wht contemp couch, Sealy Posterpedic extra firm on matt, boxspring, natural wood finish futon, negotiable; blk cloth chair & ottoman; beige wood/glass coffee & end table. 480-6440.

BR suite, Paul Bunyon poster bed, dresser w/mirror, chest of drwrs, 2 night stands, \$350. Michele, 482-9576.

Kg sz comforter, bed skirt, pillow shams, seafoam green, blue, \$45, Shawn, 472-7526,

Solid wood dining rm table w/leaf, 4 high back chairs w/padded seats, \$300. 335-1511. Antique dining set, solid oak table, 4 chairs, ex cond, \$950; Lazy Boy recliner, \$10.

Chris, x31351 or 286-0314 Patio furn, Ig table, 4 chairs, lounge chair, alider. 488-1120.

Pecan dining table, 3 leaves, 6 chairs, buffet, \$750; antique oak sec. desk, \$250; antique china cabinet, \$250; Victorian lace bears. 488-0619.

China buffet, country French, off white finish, \$350, 992-5745.

On sz waterbed, mirror hdbd, semi-motionless, heater, rail pads, 6 drwr pedestal, good cond, \$300. Sharon, x38960 or Keri, 944-8312. Decorative framed mirror, 37" x 56", \$60;

bookcase full sz bed, solid wood, \$50, 333-6542 or 482-1505. Couch, chair, ottoman, ex cond, \$160 OBO. Rob Kelso, x35483 or 480-2997.

GE elec dryer, harvest gold, good cond, \$75 or make offer. x30911 or 488-4110. Dk brwn leather couch, \$250 OBO. 280-

Wanted

5850 or 333-9078.

Want Starwars spaceships, toys, figures and books. Ron, 482-1385.

Want cheap work car for NASA co-op. Want van pool riders from NW Houston to

NASA. Wendell, 333-6050 or 466-3203. Want nonsmoking female roommate to share home in CL, \$250/mo + util. Theresa,

333-7772 or 480-6980. Want nonsmoking female roommate to share TH in Nassau Bay, \$250/mo. + 1/2 util. T.Q., x33822 or 333-0049.

Want nonsmoking roommate to share 2-2.5-1, 2 story TH in Univ Green, \$300/mo + 1/2 util. Pam, x38046 or 488-7474.

Want STS-52 payload patches. LAGEOS, USMP-1, other STS-52 payload patchs, decals or lapel pins. Andrew, 280-0647 Want batt oprated baby swing; portable

travel crib. Darlyne, 486-4508. Want Windows Word for Windows or Powerpoint, old legal versions w/books, also need a mouse. 480-2293.

Miscellaneous

1/2 caret, 14k gold marquis diamond w/3 baggets on each side, \$1K, Pete, x38614. Collection of Round Up's since '63, make offer. 482-7093.

Brothers word processor, \$275; IBM Selectric Typewriter, correcting, \$250; Round porcelain sink, bone, \$35. 488-6917.

Yamaha drum pads, \$35; DeWalt 10" radial saw, \$90; rattan rocker, \$60. Dave, x38115 or

Sliding glass patio doors, 2 sets, 6' w, 1 set 5' w w/energy screens, \$150 and \$100. Charlie, x34754 or 554-7116.

Continental Airlines, one way ticket from Houston to Orlando, Florida, 11-16-92, \$150. OBO. x38385.

Welding equipment, elec & acetylene, Ig grider & vise. 941-2495.

Two trlr towing mirrors, \$20. Tony, x35966.

Metal locking tool box, fits full sz PU, \$50. Qn sz waterbed, heater, \$175; 2 wood/ brass lamps, \$50; microwave stand, \$85; full sz microwave, \$150; one end table & coffee

table, \$25/ea. Catherine, 996-9191. Lawnmower, \$65; Mitisubishi stereo w/CD, amp, cass, spkrs, \$500; RCA camcorder,

\$700; medical bed, \$25. Tim. 996-9191. Water ski, O'Brien World Team Comp 68" \$45 OBO; bowling ball, Ace Unlimited, 16 lb, undrilled, bag, \$25 OBO; Workout equipment, DP Ultra, Gympac, DP Octagym, bench press w/free weights, \$300 OBO. 280-2546.

Beige sofa, \$75; mens & ladies 10 spd bikes, \$70/ea; Ig scenic oil painting w/wood frame, \$50; Ig print painting w/metal frame. \$10. Mark, x37491 or 335-1494.

Levelor miniblinds, one 72" x 72" full width other 60" x 72" single header dbl hung, \$50 & \$75. Charlie, x34754 or 554-7116. 8" B&D table saw w/table, \$80; 12'

Craftman band saw, \$190; Craftsman3 x 21 belt sander, \$50: Craftman wood lathe & cutters, \$120. 326-3137 or 282-6756. Opal ring, 1 lg opal w/ten garnets set in 14k gold, sz 6, was \$735, now \$350. 283-9397.

Dive trip Roatan, early May, approx \$1K, inclusive, 433-2405 Antique dresser mirror, \$75; computer

desk, \$100; men's 10 spd bike, \$50. Kevin, 486-6411 or 532-1409. Time Life Library of Photography, \$75, vari-

ety of technical books, best offer. 282-4878 or 55 gal aquarium w/pump, filter, stand, light, \$80. Howie, 482-8354 or 282-3841.

25,000+ baseball/football/basketball cards, '72-'91, incl minor stars, \$400. Scott, 486-4700. 64' ham radio tower, \$200 OBO; solid wood

baby bed, qn sz waterbed, 15 gal aquarium w/access. Brian, x32884 or 334-5045.

Whirlpool tub, 4 x 5, \$300. Mark, x38013 or 992-4132. Play pen, high chair, \$20/both; portable spa

for bathtub, \$20. x34354. Camptrails Omega ext frame backpack, 5700 cu in removable daypack, was \$200, now \$175. x37038 or 333-2938.

3 Nissan wheel covers, \$50; old tv, \$25; 4 motorcycle helmets: 300w vaccum tube amp. \$125; '85 CJ7 Jeep Laredo, \$5,999. 474-4742. The Furniture Idea Gift Certificate, was \$1067.

now \$967, expires 3-93, Karen, 538-3444. President & First Lady Gold Charter membership, \$600 OBO. Cindy, x37589 or 480-2510. Camper shell. '70 Chevy C-10 turck, ex

cond, \$275. Fred, 944-3523. Weslow Cross Training System similar to Soloflex w/stair stepper, 180 lbs of bands, \$175 OBO. Kelvin or Mary, x35909 or 488-

Golfsmith Sterling Trophy Golf Clubs, 2 -PW, \$125. x34256 or 486-3967.

Fundamental Successes

STS-52 research surpasses many scientists' expectations as commercial experiments share spotlight with NASA's



Left: Mission Specialist Bill Shepherd works with the CVTE on Columbia's middeck. Below left: Pilot Mike Baker holds up a sketch made by Shepherd showing scientists on the ground how one of the crystals in the CVTE experiment was growing. Below right: An extreme close-up shows the coils used in the CVTE furnace to process cadmium telluride crystals.

NASA Photo

Il of the experiments performed on STS-52 may not have been as flashy or easily understandable as the crew's deployment of a satellite to measure the movement of the Earth's crust, but *Columbia*'s mission was just as big of a success in other areas.

While the "telescience" experiments of the first United States Microgravity Payload beamed down real-time data on fundamental physics questions, commercially sponsored experiments examined medical and materials science questions that could lead to new treatments for diseases and faster computers.

"We were not bored, we were working pretty hard," Commander Jim Wetherbee said after landing. "Shep (Mission Specialist Bill Shepherd) would be down there in the boiler room shoveling coal as fast as he could. He had a CVTE (Crystals by Vapor Transport) experiment with a computer up on the airlock door and he's be monitoring me in the LBNP (Lower Body Negative Pressure device) and making entries into another computer with the other hand and sliding over and doing something with this experiment. It was pretty amazing to watch — and everybody was doing the same thing."

Both of the primary USMP-1 experiments in the payload bay — the Lambda-Point Experiment and the MEPHISTO directional solidification furnace — far exceeded their science objectives.

"The mission has been an unqualified success," Mission Scientist Sandor Lehoczky said. "Results obtained from these experiments are expected to make major contributions to the fields of condensed matter physics and materials science."

The Lambda-Point Experiment gleaned three times as much high-resolution data as was needed to test the Nobel Prize-winning theory that provides a mathematical explanation of how interactions at the atomic level can translate into large phenomena, said Principal Investigator John Lipa of Stanford University. The liquid helium used in the experiment made the transition from its mysterious superfluid state to a normal liquid state more than 90 times during the course of the flight as scientists on the ground used extremely precise thermometers to measure the change at the -456 degree Fahrenheit level.

"Our equipment and our ability to command it are even better than we had hoped they would be," said co-investigator Dr. Talso Chui. "This experiment is proving to be something of a pioneer in its field, and other condensed matter physicists already are becoming interested in designing space experiments based on our success."

Dr. Jean Jacques Favier of the French Atomic Energy Commission said his MEPHISTO team obtained the first real-time data on directional solidification process in microgravity, and that the ability to command the instrument from the ground resulted in an extra three days of data collection.

The MEPHISTO team was able to take advantage of crew sleep periods to make final solidification on a part of its sample, then continued to make real-time measurements on another part during the day. This allowed the team to monitor the effects of shuttle maneuvers and crew movement on solidification.

The additional operating time rewarded the team with more than 30 melting and solidification runs instead of the planned 10.

And as the Lambda-Point and MEPHISTO scientists were collecting their data, the Shuttle Acceleration Measurement System team was providing a running account of just how much vibration was being created by maneuvers and crew activity. This was the first time that SAMS, which has flown five times before, was able to receive real-time and convey that information to other experiment teams.

"The way in which the science teams, Marshall Space Flight Center and Johnson Space Center engineers, and the STS-52 crew have worked together to accomplish the science goals of the mission has once again demonstrated the true NASA spirit of teamwork," USMP Program Manager Dave Jarrett said.

The commercially developed experiments onboard *Columbia* worked on equally important problems such as a potential treatment for osteoporosis, crystals that could increase the speed of computers or determine the molecular structure of a drug used in some cancers treatments, and the effects of microgravity on the human body.

"These experiments reflect the increasing interest and willingness of U.S. industry to invest and participate in commercial research using the benefits of microgravity to develop superior products and services," said Assistant Administrator for Commercial Programs Jack Mannix.

NASA's Office of Commercial Programs sponsored the experiments to support the agency's Commercial Development of Space initiatives.

The Physiological Systems Experiment-2 was a collaborative effort of Merck & Co. Inc., West Point, Pa., and the Center for Cell Research, a NASA

Center for the Commercial Development of Space at Pennsylvania State University, University Park, Pa

"The goal of the experiment is to see if an experimental compound we're developing will prevent or slow osteoporosis from developing in microgravity during space flight," said Roy Walker, manager of scientific information with Mercke & Co. "If it does, the compound may be a useful treatment for many people on Earth who suffer bone loss from being bedridden for long periods of time due to accidents or paralysis."

The experiment also may have direct application in space as a preventive measure for bone loss that might effect astronauts on extended flights.

STS-52 also was the first flight of the CVTE crystal growth furnace, which used a vapor transport process to produce cadmium telluride crystals that are expected to be as big as a dime. Previous crystal-growth facilities have been able to grow samples only as big as a pencil eraser.

"For the first time, shuttle astronauts are able to watch the crystals in the furnace and make adjustments during the process to grow the largest, purest and most uniform crystals possible," said Cindy Naucler, a member of the Boeing Defense & Space Group, Missiles & Space Division, Kent, Wash., team that developed the CVTE payload with NASA.

"This experiment is important to the semiconductor industry because the ability of semiconductors to process and store information is dependent on the quality of the crystals used," said Boeing CVTE. Program Manager Barbara Heizer. "Large, uniform crystals grown during space flight may lead to greater speed and capability of computers, sensors and other electronic devices."

The Commercial Protein Crystal Growth experiment used a Protein Crystallization Facility to obtain high-quality crystals for drug research.

Using the PCF data, researchers studied the crystallization of the biologically important molecule, alfa-2b interferon, an anti-viral, anti-cancer agent with approval pending for several novel therapeutic uses, such as hepatitis, multiple myeloma and as an adjunct to AIDS therapy.

The results of research through Commercial Materials Dispersion Apparatus Instrumentation Technology Associates Experiments-1, which focused on how cell structure and function are altered in microgravity, could contribute to remedies for some physiological problems experienced by astronauts during space flight.

The problems include bone demineralization, muscle atrophy, cardiovascular deconditioning, reduced immune cell response and decrease in red blood cell count, according to Dr. Marian Lewis, a senior research associate at the University of Alabama in Huntsville and manager of CMIX-1. The CMIX-1 experiments were developed by the Center for Materials Development in Space, a NASA CCDS at UAH.

Some of the CMIX-1 experiments are using human, mouse and frog cells to learn how the human body responds to living in the weightless environment of space flight. The cells were maintained at a constant temperature and chemically stimulated to grow in microgravity.

"The information obtained from cell tests such as these may be crucial in preparation for Space Station *Freedom* where astronauts will have long-duration stays in space," Lewis said. "The results also may give clues about cell structure and function which potentially could improve treatment of osteoporosis, anemia and immune deficiencies on Earth."

The UAH CMDS will conduct the majority of its experiments in two minilabs. The MDA, developed by Instrumentation Technology Associates Inc., Exton, Pa., is a brick-sized, automated device capable of mixing up to 100 separate samples of multiple fluids and/or solids at precisely-timed intervals.

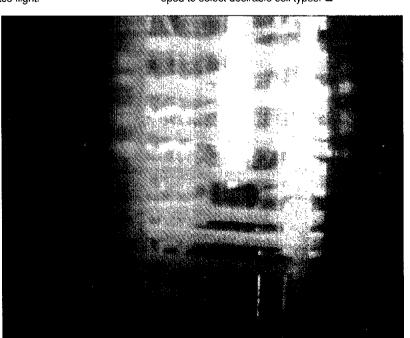
In addition to the two MDAs used by the UAH CMDS, two others were used by ITA and its commercial customers. Their experiments include protein crystal growth, inorganic assembly, biomaterials processing, dye and yeast cell diffusion and engineering tests of the MDA.

Potential commercial applications of the ITA experiments are expected in environmental sciences, drug research and development, electronics and cell pharmacology.

ITA also is donating 5 percent of its MDA capacity to high school students in Florida, New Jersey, Pennsylvania, Virginia and Washington, D.C. The students hope to learn how the clotting process occurs in microgravity and how microgravity affects the early development of brine shrimp.

The UAH CMDS also conducted live cell investigations designed to gain information on how cells of the human immune system may be induced to grow when exposed to certain compounds. Once scientists discover how cells respond to these compounds in microgravity, techniques may be developed to select desirable cell types. \Box





Stars in distant galaxy may be long-sought protogalaxy

thought to contain old stars older than some estimates of the age of the universe - may instead be a very young system caught in the act of formation, astronomers

The finding, by Dr. Peter Eisenhardt of NASA's Jet Propulsion Laboratory, Pasadena, Calif., and graduate student Mark Dickinson of the University of California at Berkeley, was reported in the Nov. 1 issue of the Astrophysical Journal (Letters).

According to Eisenhardt and Dickinson, radio galaxy B2 0902+34 in the constellation Lynx previously mystified astronomers because its stars seemed to be much older than the universe itself.

The universe was about 1 billion years old when the light seen today left the galaxy, the astronomers say. Light from stars within the galaxy, however, suggested the stars were much older than 1 billion years at the time.

Astronomers believe the universe is about 13 billion years old.

"Our new finding resolves the problem of how these stars possibly could be older than the universe." said Eisenhardt.

'In fact," he added, "it now appears that this object may be a protogalaxy — one of the holy grails of astronomy." Since the 1960s, astronomers have been searching for examples of galaxies in the process of forming.

The previous estimate for the age of the stars in galaxy B2 0902+34 came from 1988 observations by Dr. Simon Lilly, then an astronomer at the University of Hawaii.

Lilly's measurement set the record for the most distant galaxy then discovered. At more than 10 billion light-years, B2 0902+34 is still among the most distant known

Because astronomers were looking back across nearly 90 percent of the age of the universe in observing the light from the galaxy, B2 0902+34 should have been a very young galaxy. Yet Lilly found that the galaxy had a very red color, a sign of old age.

In their new observations at Kitt Peak National Observatory, Eisenhardt and Dickinson measured a color 10 times bluer for the galaxy, indicating its age is much younger than previously thought.

"The galaxy's color is so blue, as a matter of fact, that it is a good

the process of forming the bulk of its stars," said Eisenhardt.

He said that the discrepancy between the new observations and Lilly's measurements is due in part to a problem with the infrared camera used by Lilly in 1988. In addition, Eisenhardt says the starlight is contaminated by emission from hot oxygen gas, which Lilly's report on the galaxy did not take into account.

Eisenhardt's and Dickinson's work is supported by funding from NASA Headquarters Office of Space Science and Applications.

Grumman wins JSC information systems support contract

Grumman Technical Services Division of Titusville, Fla., has won the right to negotiate for JSC's fiveyear, \$300-million Information Systems Contract for all non-mission computing services.

The subsidiary of Grumman Corp., Bethpage, N.Y., will provide data systems maintenance and operations, personal workstation installation and maintenance, networks and telecommunications services and program integration and development for the institutional requirements of the center beginning Jan. 1, 1993.

The contract will be awarded on a cost-plus-award fee basis.

The contract work covers Federal Information Processing resources in support of institutional systems at JSC and includes virtually all computing work other than direct mission support.

Computer Sciences Corp. currently holds the contract.

Total Quality programs to be shown next week

Shuttle Management and Operations Director Jay Honeycutt will host a NASA Continuous Improvement Colloquium next week.

Honeycutts' discussion, at noon Thursday in Teague Auditorium and on JSC Television Distribution System Channel 4, will focus on shuttle processing improvements at Kennedy Space Center.

Also beginning next week is a two-week series of videos from the W. Edwards Deming Tape Library that will be shown in various locations. The educational series by one of the leading Total Quality implementation philosophers, will be shown daily at noon starting Monday. All civil servants and contractors are invited. The schedule is

Monday — "The New Economic

Age," Bldg. 12, Rm. 256.

Tuesday — "The 14 Points," Bldg. 1, Rm. 360A.

Thursday — "Corporate Leader-ship," Bldg. 30 Auditorium.

Friday — "Adoption of the New

Philosophy," Teague Auditorium. Nov. 16 — "Communication of the New Philosophy," Bldg. 30 Auditor-

Nov. 17 — "Application of the New Philosophy," Teague Auditorium.

Nov. 18 — "How Managers and Workers Can Change," Teague Auditorium.

Nov. 19 — "Cooperation — The

Key to Quality," Teague Auditorium. Nov. 20 — "The Dangers of Burying on Price Alone," Bldg. 30 Auditorium.

For more information, call E. Edwards at x34228.



DIRECTORS ALL --- A packed house at the NASA Alumni League-sponsored Space Exploration '92 conference listens to a panel discussion featuring the leaders of all eight NASA field centers. From left are Victor Peterson, deputy director of Ames Research Center; Dr. John Klineberg, director of Goddard Space Flight Center; JSC Director Aaron Cohen; Robert Crippen, director of Kennedy Space Center; Pual Holloway, director of Langley Research Center; Lawrence Ross, director of Lewis Research Center; Thomas Lee, director of Marshall Space Flight Center; and Roy Estess, director of Stennis Space Center.

Space Station Control limits access

Security card readers to be activated Monday

The new Space Station Control Center will become a controlled access area effective Monday, according to JSC security officials.

Card readers in Bldg. 30S will be activated and CAA cards will be required for access past the lobby of the building. Conference Rm. 1352 will remain accessible from the lobby without a CAA card and will be used for meetings scheduled by the Flight Director Office.

Anyone who now has unescorted access to the Mission Control Center or the Space Station Computer Facility will have SSCC access added automatically to their CAA cards.

Anyone else who requires access to the building must present a completed JSC Form 722 to the Bldg. 30 badging office for process-

A list of those who are authorized to sign as the approving official on JSC Form 722 is available in the Bldg. 30 badging office.

STS-52 crew thanks co-workers for helping carry fire

(Continued from Page 1)

people and getting ready for the flight," he added. "Even the meetings were fun because we had a purpose, we had a mission. And I'm looking forward to going back to some more meetings.

Columbia's picture-perfect landing at KSC capped a mission that went to the fundamental heart of research in superfluid dynamics, crystal growth, human physiology in zero gravity and machine vision systems.

After launching Laser Geodynamics Satellite-II early in the flight, the crew turned its attention to a host of middeck investigations and to a detailed evaluation of the Canadian-developed Space Vision System that is the precursor of

robotic vision that will help build and maintain Space Station Freedom, as well as lunar and Mars bases of the future.

"We had a great crew, a great flight, and as usual I've got to say that we owe it to the great team here at JSC and KSC and throughout the country," said Pilot Mike Baker. "We obviously could not have done it without you and we appreciate your help.'

Mission Specialist Lacy Veach guided what Canadian Payload Specialist Steve MacLean called the "Canada arm" and the dominolike Canadian Target Assembly through a series of movements that will be used during space station assembly and Hubble Space Telescope repair missions as

MacLean followed along with the SVS, sending life-like computer graphics back down to the ground. They released the CTA early Saturday morning and tracked it as it drifted away from Columbia toward an atmospheric reentry and destruction about a day later.

"I see happy faces out there in the lights, and there are a lot of happy faces here behind me, too, and I know thousands of other happy faces all over this country and other countries tonight" Veach said, "because once more we've gone into harms way and come back with a lot of good science.'

"All of us will always remember that we all pulled together and carried fire just one more small step in this fantastic adventure, the

greatest adventure that humankind has ever undertaken," he added.

"It really was something special." said Canadian Payload Specialist Steve MacLean. "I really feel proud of what we did and what we achieved, and I really look forward to using the systems that we have on station and perhaps on the Moon and Mars in the

Mission Specialist Bill Shepherd shared his experience of looking at the vast expanse of Africa from 113 nautical miles up with its huge red sand dunes stretching out for a hundred miles in every direction. Wetherbee and Baker had taken Columbia to the unusually low orbit to maximize lighting conditions for landing and to facilitate studies of Orbiter Glow as it passed through high-velocity atoms.

'There wasn't a thing on there that I could see that I could look at and say man made that or man's here. It struck me at that moment that this could be some other planet. This could be some other place in the universe, Shepherd said. "I think great things are ale in the space program, and I'm proud to be part of the team that makes that happen. These things are within our grasp and let us go reach for them."

"I'm very proud of what we accomplished on STS-52, but it is really nice to be home," said Mission Specialist Tammy Jernigan.

The crew is scheduled to brief employees on the mission at 1 p.m. Nov. 16 in Teague Auditorium.

JSC expo to court small businesses

JSC and its major contractors will host a Small Business Expo on Nov. 20 to learn what small, small disadvantaged and women-owned small businesses can do for them.

The expo, which will run from 9 a.m. to 2 p.m. at the Gilruth Center. is designed to create new markets for suppliers and new sources for buyers and JSC organizations. The expo will allow small businesses to identify current business opportunities and who they should contact, and explain NASA purchasing procedures.

It also will help the hosts identify and screen new competitive sources of quality products and services to help NASA achieve its goal of awarding at least 8 percent of its contracts to socially and economically disadvantaged businesses by the end of fiscal 1994.

Thirty-eight booths will be manned by representatives from JSC and its prime contractors. The expo is free and all small business-

es are invited to attend. For more information, 'call Barbara Kirkland at x34512.

Space News

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EditorKelly Humphries Associate EditorKari Fluegel

Annual pecan harvest next week

The Employee Activities Association will sponsor its annual harvest of the pecan grove along JSC's south side from 9 a.m. to noon Nov. 14.

Free tickets will be available at the Bdlg. 11 Exchange Store starting Monday, with one ticket per NASA

badged civil service or contractor employee being distributed on a firstcome, first-served basis. The tickets will be exchanged for collecting bags at the pecan orchard the morning of the harvest. For more information, call Ginger Gibson at x30596.

Goldin announces high-level appointments

(Continued from Page 1)

Corps in September, served as president of the Armed Forces Staff College from 1987-89.

Thomas received a degree from

Harvard Law School in June 1978. After working in a law firm for two years, he became an instructor in clinical law at George Washington University National Law Center.