



Fantastic journey

New science is the hallmark of the STS-40 Spacelab Life Sciences-1 mission. Story on Page 3.



Ribbon cutting

Workers in Bldg. 45 took time out this week to welcome home one of JSC's Operation Desert Storm soldiers. Photo on Page 4.

Space News Roundup

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No. 20

Columbia's crew ready to be poked, prodded for science

By Kelly Humphries

STS-40 crew members, some of whom have been waiting more than a decade for the Spacelab Life Sciences-1 mission, said Tuesday they are eager to begin collecting information about how the human body reacts to the space environment.

"If you could imagine, living in a house with a big room and the door shut for 7 1/2 years and the door's going to open next week — I'm really anxious to see what's in there," said Payload Specialist Drew Gaffney, a cardiologist at the University of Texas who first submitted his SLS-1 experiment proposal in 1978.

Three of the crew members, Gaffney, fellow

Payload Specialist Millie Hughes-Fulford and Mission Specialist Rhea Seddon, have been assigned to the payload since 1984. Commander Bryan O'Connor, Pilot Sid Gutierrez and Mission Specialists Tammy Jernigan and Jim Bagian, have been training for the flight for the past year and a half.

"We're really excited that we're this close now," O'Connor said.

Columbia, scheduled to lift off from Kennedy Space Center's Pad 39B at 7 a.m. CDT Wednesday, will carry the seven-member crew on a journey into space and into their

own bodies as they perform experiments that explore how the heart, blood vessels, lungs, kidneys and hormone-secreting glands respond to microgravity. The first Spacelab dedicated to life sciences research also will look at the causes of space motion sickness and changes in muscles, bones and cells in the weightlessness of space

flight and in the readjustment to gravity upon returning to Earth.

The experiments performed on the crew and on laboratory animals will provide the most detailed and interrelated physiological

measurements acquired in the space flight environment since the Skylab program.

"A lot of these tests have taken place individually," said Seddon, a physician who first flew on STS-51D, "but never before have we had four subjects over a long period of time testing many systems and seeing how they're all integrated together."

Three of the crew members, O'Connor, Gutierrez and Jernigan, will comprise the orbiter crew, making sure that *Columbia's* systems can support the detailed studies going on in the pressurized Spacelab module in the payload bay. The rest will comprise the payload crew, concentrating on

Please see **SPACELAB**, Page 4



Security relief won't eliminate access checks

The phase out of security restrictions put in place for secret Department of Defense missions should be complete by the end of May, according to JSC security officials.

The phase out will mean a significant reduction in the number of areas at JSC that have special access requirements, but it won't mean the end of all Physical Control Zones, said JSC Security Officer Ron Wade.

Security restrictions on cameras, pagers and other electronic devices will be lifted, but radio transmissions will not be allowed in some areas for other reasons.

After formal decertification of the classified systems, he said, the only areas that will require special badging or escort will be those designated as national resources under the NASA Resource Protection Program, such as the Mission Control Center, the Mission Evaluation Room and the Software Production Facility.

Employees will still need to run their PCZ cards through the readers to gain access to those areas, but "secret" clearances will no longer be needed to obtain PCZ cards. Employees who already have PCZ cards will continue to have access, and new PCZ cards will be issued with the proper approvals.

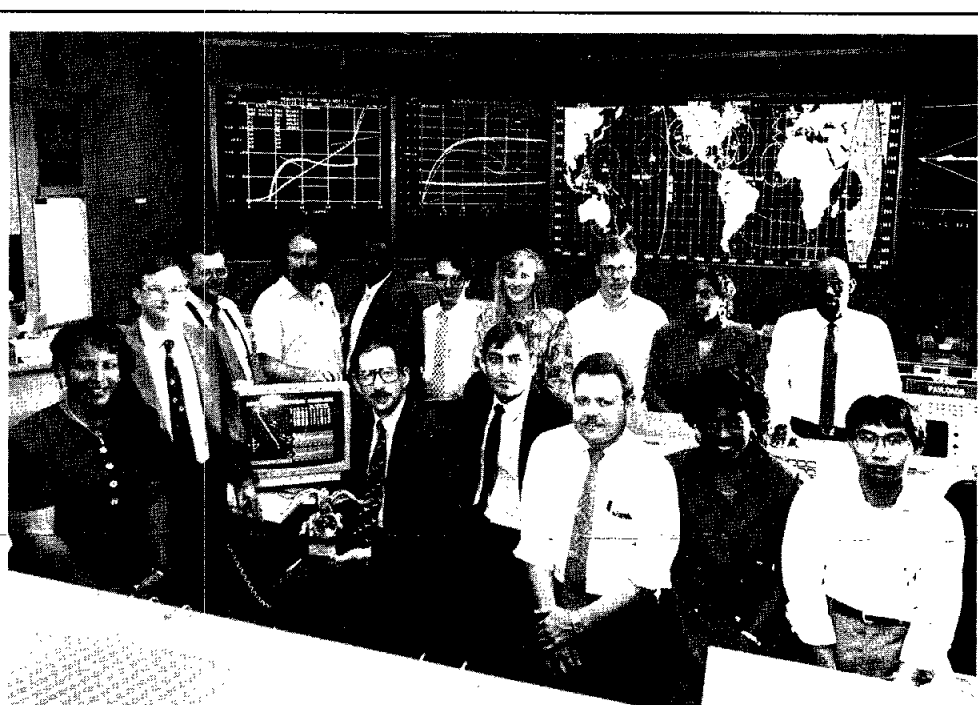
PCZ cards will be issued after a minimum National Agency Check investigation, Wade said. When security receives a JSC Form 722 requesting a PCZ card officials there will make sure an investigation has been conducted or they will initiate one.

As these restrictions are being lifted, security also is withdrawing secret clearances from employees who will no longer be working with classified information, said Bob Nooney, the security specialist coordinating the recertification of clearances. Administrative withdrawal of clearances will have no effect on access to national resource facilities.

Secret clearances are justifiable only for employees who routinely attend classified meetings or handle classified materials. If a sudden need should arise, most JSC employees can be granted interim clearances the same day, Nooney said.

Employees who have questions about declassification of an area should call Wade at x34016.

Employees with questions about clearances should call Nooney at x34019.



JSC Photo by Bill Blunck

John Muratore holds his Carnegie Mellon trophy while at one of the expert systems displays in Mission Control. To Muratore's right is Troy Heindel, who is now heading the project. With them are project workers and alumni, clockwise from left, Cheryl Whitaker, Arthur Rasmussen, James Graham, Curtis Rendon, Galvon Moses, Norman Knight, Terri Murphy, Ken Dwyer, Debbie Horton, Paul Kent, Giau Ho, Kimberly Hicks and Robert McFarland.

Muratore earns prestigious award

Expert systems expert cited for computer applications

By Jeff Carr

JSC's John F. Muratore, a leader in the use of computerized expert systems in the Mission Control Center, has been named a winner in the prestigious annual Carnegie Mellon achievement awards.

Award co-sponsors, American Management Systems Inc. and Carnegie Mellon University's Graduate School of Industrial Administration, recognized Muratore out of 500 nominees for "outstanding contributions" to his organization "through the effective use of computer systems and communications technology." He was cited specifically for his leadership in the introduction of expert systems in Mission Control.

Please see **MURATORE**, Page 4

JSC ties to Low Trophy nominees are extensive

The two Houston companies nominated for the 1991 George M. Low Trophy, NASA's quality and excellence award, are not the only nominees that have ties to JSC.

Three of the other nominees, Honeywell's Space and Strategic Systems Operation, Clearwater, Fla.; TRW's Space & Technology Group, Redondo Beach, Calif.; and Cray Research Inc., Chippewa Falls, Wis., all hold JSC contracts.

Together with Computer Sciences Corp.'s Applied Technology Division and Unysis Space Systems Division, they make up five of the eight nominees for this year's award recognizing outstanding achievements in quality and productivity improvement and total quality management.

The majority of Honeywell's NASA contracts are with JSC.

Honeywell provides JSC with definition, design, development, production and logistics support of the space shuttle flight control, attitude control and determination and hand controller systems, and the subsystem control interface electronics for Space Station *Freedom*.

Although the majority of TRW's NASA contracts are with Goddard Space Flight Center, TRW provides JSC with support for the Mars Rover Sample Return Mission study and a plasma motor generator tether system study.

The majority of Cray's NASA contracts are with Ames Research Center, but the company has provided JSC with a supercomputer that is helping engineers and scientists perform incredibly complex calculations in a variety of areas.

Countdown clock ticking for Columbia

By James Hartsfield

Kennedy Space Center's countdown clock will start ticking for the third shuttle launch in less than two months at 4 p.m. CDT Saturday, as *Columbia* aims skyward for STS-40 and Spacelab Life Sciences-1.

Shuttle managers slated the STS-40 launch for 7 a.m. CDT Wednesday following a final status review of all systems, facilities and people early this week. *Columbia's* crew will depart Houston Sunday morning for KSC and an ultimate 140 nautical mile-high destination.

"I'd like to point out that it's been since the Skylab Program in the early '70s that we've had a mission where we spent an extensive amount of time doing in-depth medical operations," STS-40 Lead Flight Director Al Pennington said Tuesday. "We have something new to challenge us here in getting back into medical-oriented flights."

On the heels of STS-37, which successfully deployed the Gamma Ray Observatory with a helping nudge from spacewalker Jerry Ross, and STS-39, which conducted the most complex rendezvous operations in shuttle history, STS-40 will be NASA's third shuttle launch in 47 days, a record short span.

With an on-time launch, *Columbia* would land at Edwards Air Force Base, Calif., at 10:51 a.m. CDT May 31. A landing then would mean Americans had spent almost one month out of the past two in space. This week, launch preparations already have hit full steam at Launch Pad 39B. The STS-40 solid rockets were closed out for flight Wednesday; *Columbia's* engine compartment will be closed out today; and the external fuel tank was purged and ready for its launch fill-up by Thursday.

Endeavour was powered up this week to pressurize the main engine plumbing. *Discovery* is going through post-flight inspections. *Atlantis*, next at bat, is moving smoothly toward a July launch on STS-43.



JSC Photo by Robert Markowitz

AIMING FOR BULL'S-EYE—Bob Bakken of Minnesota takes aim and Chris Castner of New York prepares to shoot at the 1991 World Target Archery Championship Trials held May 8-12 at JSC. Ninety-seven competitors enjoyed shooting weather near Rocket Park, said JSC's Rick Stonebraker, an EBASCO employee who organized the event.

JSC

Ticket Window

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

General Cinema (valid for one year): \$4.
AMC Theater (valid until May 1992): \$3.75.
Loews Theater (valid for one year, can be used two weeks after premiere): \$4.
Astroworld (valid 1991 season): season, \$44.94; child less than 4 feet, \$10.12; one day, \$15.85; Waterworld, \$8.15.
Seaworld of Texas (valid 1991 season): child (3-11), \$12.25; adults, \$17.25.
Six Flags (valid until Nov. 17, 1991): 1-day, 15.95; child less than 4-feet, 14.95; 2-day, 20.95.

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Gilruth Center News

Defensive driving—Course is offered from 8 a.m.-5 p.m., July 13 and Aug. 10. Cost is \$15.

Aerobic dance—Eight-week session meets 5:15-6:15 p.m. Tuesday and Thursday nights. Cost is \$24.

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

Weight safety—Required course for employees wishing to use the Gilruth weight room. The next class will be from 8-9:30 p.m. May 22. Cost is \$4.

Country and Western Dance—Six-weeks of Monday sessions begin June 17. Cost is \$20 per couple.

Tennis—Six-week beginning class meets Mondays starting May 20. Intermediate class meets Wednesdays starting May 22. Cost is \$32.

Aikido—Martial arts class meets Tuesdays beginning May 14. Cost is \$30.

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Technical Library News

The following selections are now available in JSC's Technical Library, Bldg. 45, Rm. 100.

Cosmic Odyssey. Jean Heidmann, 1989. QB981 .H44 1989.

How to Run a Successful Meeting-In Half the Time. Milo Frank, 1989. HF5718 .F74 1989.

Italian, Quick and Easy. Diethard Lubke, 1984. PC1121 .L8 1984.

Achieving Excellence (videorecording). Lou Heckler, c1986. HF550.2. A23 1986.

JSC

Swap Shop

Property

Rent: Arkansas cabin on Blue Mountain Lake, accomm up to 8. furn. \$50/day, \$250/wk. 338-2517.

Rent: Lake Livingston, waterfront house, 3-2 CA&H, fully furn, covered decks, pier, good cond, wknd/wk rates. 482-1582.

Sale: Egret Bay Condo, 2-2, CP, all appl, waterfront community, FPL, blinds, fan, patio, storage, pools, boat ramp \$42,900. x30092 or 481-3637.

Rent: Friendswood area, enclosed RV storage stall, 40' deep, lights/power, reasonable. 482-9396.

Sale: Lake Travis time share, 2 BR incl RCI worldwide exchange privileges, \$8000 OBO, Robert. 333-7775 or 488-8935.

Rent/Lease: CLC Condo on marina, three level, all appl, FPL, wet bar, 2-2-2, \$850/mo. 474-4922.

Rent: Lake Travis cabin, private boat dock, CA/H, fully equip, accom 8, wk/day \$425/85. 474-4922.

Sale: University Green townhome, 3-2-5-2, good cond, \$82K, 486-6834.

Sale: Hilltop Lakes cabin lot in Leon Condo, private airstrip, bass fishing, golf course, tennis \$9,500. 282-1727 or 333-5177.

Sale: CLC/Camino South, 3-2-2, renovated in contemp colors; lg yard, \$74K. 280-9861.

Sale: CLC two-story condo, 1-1-5-1CP, all appl, alarm, FPL, patio, balcony, ceiling fan, \$38K, low pmts. 486-0508.

Lease: CLC area, condo 2-1, FPL, all appl, vaulted ceilings, mini blinds, swimming pools, storage, W/D conn, \$475/mo. x31275 or 486-0315.

Lease: Webster/Ellington, 2-1, W/D, pool, \$460/mo. Dave, x38156, or Eric, x38420.

Lease: Wedgewood Village/Friendswood, 3-2-2, lg recn, over 2,000 sq ft, Jeff, 333-7010 or 482-5393.

Sale: Pearlland, Southwyck, 3-2-5-2A, 3 yr old 1.5 story brick Tudor, 5 ceiling fans, mini-blinds, FPL, assume 9.5% w/app, low equity, \$92K. 997-2069.

Lease/Sale: 1 BR villa on the water, W/D, FPL microwave, fridge w/ice maker, 2 ceiling fans, boat incl, \$550/mo or \$43K. Sean, 996-7692 or 283-9323.

Sale: Friendswood, 3-2-2, brick, new vinyl siding/trim, paint, paper, dishwasher, parquet floor, \$68K. 482-6651.

Lease: Nassau Bay, 4-2-2, no pets, 2 living areas, newly redecorated, deck, 1.5 story, 2000 sq ft, \$890/mo. 333-6806 or 484-1344.

Lease: League City 4-2-house, lg master suite, ceiling fans, no pets, \$675/mo plus dep, avail June 8. Merrifield, 333-2437.

Rent: Nassau Bay townhouse, 4-2-2, over 2,000 sq ft, master/dwn, huge garage, 2-story den, FPL, deck, atrium \$1,095/mo, Jerry, x38922 or 488-5307.

Sale: Pipers Meadow, 3-2-5-2, formal LR/DR, FPL, loft, wet bar, fans, gar door opener, deck, landscaped, new paint, \$88K. Dennis, x34405 or 480-5076.

Condo Rental: 2-2, W/D conn, FPL, reserved parking, nonsmoker, no pets, refrig, \$150/mo, avail June 1. x38889 or 480-1340.

Rent: Galveston condo, furn, sleeps, 3, Seawall Blvd & 61st, cable TV, swimming pools, wknd/wkly/dly rates. Magdi Yassa, x38470 or 486-0788.

Sale: Dickinson Dove Meadows, 3-2-2, 1800 sq ft, brick, lg screened porch, FPL, \$72K. x39182 or 534-2179.

Sale: Hangar, 2025 sq ft, 12' high bifold doors, 409 sq ft apt on top, Houston SW airport, all electric and plumbing, lot is 55' x 115', building and land \$80K. 487-4705.

Cars & Trucks

'82 Ford Bronco, 4x4, new eng 3K mi on rebuilt trans, new work on manifold, 90K mi. 568-4099 or 282-4271.

'88 Dodge Dart, 170 slant six, PS, AT, new tires, rebuilt eng, new starter, good cond, \$400 OBO. 280-2510 or 486-4439.

'85 Lincoln Town car, signature ser, loaded, wire wheels, 76K mi, ex cond, \$8000. x36604 or 482-7156.

'87 Chevy IROC-Z Camaro, loaded, T-tops, ex cond, low mi, auto, new tires, \$8900. 585-8932.

'81 Thunderbird, AC, PS, PB, cruise, AM/FM/cass, runs good, \$900. Bob, 283-4146 or 482-4320.

'79 Cadillac coupe, 88K mi, \$850 OBO. Rick, x36159.

'85 Honda Civic, 4 dr sedan, 72K mi, 5 spd, good cond, \$3000 OBO. Elizabeth, x37270 or 996-9705.

'84 Nissan 300ZX 2+2, auto, A/C, \$5650; '80 Pontiac Phoenix V6, auto, A/C, cruise, \$1950, sell one, not both. x30092 or 481-3637.

'78 Camaro, looks and runs good, \$1395. 333-6671 or 332-9105.

'83 Ford F-150 Supercab, in-line-6, 3 sp plus OD, AM/FM cass, bed liner, seat covers, sliding rear wdws,

good cond, \$2850. 339-1337.

'85 Ford F-150 Supercab, 300 cubic in 6-cyl auto, cruise, A/C, toolbox, shortbed, good cond, \$3895 OBO. Hugo, 286-0432 or 335-2552.

'76 Datsun 280Z, 2+2, auto, A/C, cruise, needs work, 180K + mi, \$800 OBO. 486-2609.

'86 Chevy Celebrity, 4 dr, PS/PB/AC/AT, ex cond, \$5195. 333-3309 or 248-2484.

'85 BMW 3181, blk, sunroof, good cond, \$6500. Eve, 480-7213.

'77 Chev Monte Carlo, 350 V8, 116K mi, AC, AM/FM/cass, new tires, new trans w/1 yr warranty, runs great \$1200 OBO. Mark, x37491 or 335-1494.

'87 Toyota MR-2, 33K mi, white 5-spd, sunroof, spoiler, ex cond \$10.5K OBO. Mike, 283-5579 or 332-1617.

'84 Nissan 300ZX, 2+2 5-spd, silver blue, 66K mi, A/C, T-tops, pwr wdws, AM/FM/cass, \$6,000 OBO. x37546 or 480-1937.

'88 Chev Beretta, 34K mi, Z51 option, 2.8 liter Y6, 5-spd, pwr str, pwr brakes, A/C, premium AM/FM/cass, \$6750 OBO. 488-1706.

'79 Dodge Omni hatchback, runs good, new clutch/brakes, AM/FM/cass, new inspection/license, \$750. 282-4898 or 481-9523.

'78 Triumph Spitfire convert, 43K mi, good cond, \$2000. 332-7657.

'82 AMC Eagle sedan wagon, 4WD, loaded, leather, 76K mi, \$2,500 good cond. x34213 or 286-7149.

'76 Pontiac Le Mans, new A/C, recent tune-up, \$400.00 radio, \$500.00, Chuck, x36343 or 333-4795.

'82 Ford Van XLT, ex cond, \$3500.00. x30425 or 941-2495.

'80 Honda Civic hatchback, 2-dr, 5-spd, A/C, \$450. Leonard, x37587.

'72 MGB, new top, brakes, and exhaust, 78K mi, blue, \$2,800. 482-6651.

'79 VW Rabbit, needs timing belt, water pump, good cond, \$700.00 OBO, will sell parts. Channing, 333-5310 or 484-2113.

'82 Chevy Suburban Silverado, dual A/C, new trans, trlr pkg, 79.9K mi, \$3850. x30186.

'86 Dodge PU, V8, PS, PB, auto, camper shell, AM/FM/cass, low mi, \$5800. Matt, x34285 or 486-7280.

'89 Ford Probe GT Turbo, ex cond, \$10,895. Dan, 280-2780 or 457-2850.

'89 Dodge Caravan SE, ex cond, 27K mi, factory 770 warr, \$11,950. 992-4729.

'82 Mercury Cougar, ex cond, PS, A/C, AM/FM, 4 dr, \$2000. Richard or Cindy, 337-5630.

'81 Volvo 242 DL, white/blue int, A/C, cruise, 4 spd w/OD, 86K mi, ex cond, \$3,750/OBO. Don, x39348 or 480-8329.

'85 Mitsubishi 1/2 ton PU, 80K mi, A/C, AM/FM/cass, new tires/batt/timing belt/clutch, \$2250. Marcus, x34046.

'85 Jeep CJ-7, red, black hard top & bikini top, 6 cyl, 5 spd, A/C, PS, AM/FM/cass, 59K mi, \$6500. 470-0777.

'84 Buick Park Avenue, ex cond, low mi, \$4500 OBO. Wayne, x30693 or 996-9157.

'79 Mercury Zephyr, \$500. Laurie, 282-3170 or 992-5907.

'73 Triumph Spitfire MK IV, 1500 cc, all or parts. Mike, x34359 or 332-7858.

'79 Ford PU, rebuilt 400 eng; Datsun Z260; Chev S10 PU, rebuilt V6; '74 Chev 1 Ton, good 350 eng, sell any parts. 332-1811.

'88 Mitsubishi Precis, 5 spd, AC, AM/FM/cass, good cond, \$2000. 333-7070 or 482-2342.

'88 Ford Mustang LX hatchback, 14K mi, V8, auto w/OD, A/C, all pwr, cruise, AM/FM/tape, custom wheels, handling pkg, security sys, \$8,450 OBO. 482-1535.

Cycles

'85 Yamaha Maxim 750, runs great, helmet incl. Todd, 283-1844 or 484-5002.

Yamaha RZ350, Kenny Roberts Replica, pro eng porting, Mikuni carb, pipes, K & N Jet kit, Dunlop radials, incl bike cover and helmet. \$1995 OBO. Hugo, 286-0432 or 335-2552.

'84 Kawasaki GPZ 750, 8.5K mi, super clean, \$2000. Shannon, x32646 or 484-5412.

Ladies 24" Vista Bike, 3 spd, \$100. 283-5465 or 332-1725.

Raleigh 19" 12 spd trl-lite, index gears, aero handlebars, red, ex cond, \$250 OBO. x49755 or 335-1862.

Diamond Back bicycle, ABA No 1, 20" frame, \$50.00. 479-8311.

Boats/Planes

Ouachita, 17' alum canoe, \$400.00. 474-4663.

'83 Renken 18' sailboat, roller furling jib, 4 hp aux,

JSC

Today

FWP luncheon—JSC's Federal Women's Program will host its annual luncheon at 11:30 a.m. May 20 in the Gilruth Center ballroom. Houston Mayor Kathy Whitmire will be the keynote speaker. For more information, call Freda Marks at x30603.

Cafeteria menu—Special: tuna and noodle casserole. Entrees: liver and onions, deviled crabs, roast beef with dressing. Soup: seafood gumbo. Vegetables: whipped potatoes, peas, cauliflower.

Monday

Cafeteria menu—Special: breaded cutlet. Entrees: beef chop suey, Polish sausage with potato salad. Soup: French onion. Vegetables: okra and tomatoes, green peas.

Tuesday

Cafeteria menu—Special: fried chicken. Entrees: Salisbury steak, shrimp Creole. Soup: split pea. Vegetables: mixed vegetables, beets, whipped potatoes.

Wednesday

NSS conference—The National Space Society will host the 10th annual International Space Development Conference May 22-27 at the Hyatt Regency on the Riverwalk in San Antonio. The theme is "Space: A Call for Action." For more information, call Steven Shepard at (512) 520-4821 or Beatrice Moreno at (512) 522-2260.

BANN meets—The Bay Area

Dates & Data

NAFE (National Association of Female Executives) Network will meet at 11:30 a.m. May 22 at the South Shore Harbour Country Club in League City. Guest speaker will be Lori Evans, president and founder of Progressive Concepts Co. For more information contact Wanda Spain 483-0125.

Cafeteria menu—Special: stuffed bell pepper. Entrees: fried catfish with hush puppies, braised beef rib, barbecue plate, wieners and beans, shrimp salad. Soup: seafood gumbo. Vegetables: corn O'Brian, rice, Italian green beans.

Thursday

JSC Blood Drive—The second on-site JSC Blood Drive of the year will be from 8-11:30 a.m. and 1-3:30 p.m. May 23 at the Gilruth Center. For appointments, call Mary O'Rear, x36531; Helon Crawford, x34159; or Dan Mangieri, x33003.

NCSA meets—The National Contract Management Association Space City Chapter will recognize the "Contract Manager of the Year" at an 11:30 a.m. luncheon May 23 in the Gilruth Center ballroom. Advanced tickets are \$5 for members; at the door, tickets are \$6 for members, \$7.50 for guests.

NASACOM meeting —NASACOM (a Commodore User's Group for the C64, 128 and Amiga computers) will meet at 7:30 p.m. May 23 at the Clear Lake Park Bldg. For more information contact Glenda at x31764.

Cafeteria menu—Special: barbecue smoked link. Entrees: beef Stroganoff, turkey and dressing. Soup: chicken noodle. Vegetables: Lima beans, buttered squash, Spanish rice.

May 24

Cafeteria menu—Special: meat sauce and spaghetti. Entrees: baked scrod, liver and onions, fried shrimp. Soup: seafood gumbo. Vegetables: green beans, buttered broccoli, whipped potatoes.

May 27

Memorial Day—Most JSC offices will be closed May 27 in observance of the Memorial Day holiday.

May 28

BAPCO meets—The Bay Area PC Organization (BAPCO) will meet at 7:30 p.m. May 28 at the League City Bank and Trust. For more information contact Earl Rubenstein, x34807 or Tom Kelly, 996-5019.

June 2

LDEF symposium—NASA will sponsor the first Long Duration Exposure Facility post-retrieval symposium June 2-8 at the Hyatt Orlando Hotel in Kissimmee, Fla. This is the first of three planned symposiums involving the dissemination of LDEF data with team members and the international community. For more information contact Arlene Levine at (804) 864-3782.

galv trlr, sleeps 4, good cond \$4K. 339-3476.

Audiovisual/Computers

Macintosh 8.24 display card, new 16.8 million colors, \$499. Brian, 333-7695 or 480-1844.

AM/FM Stereo console w/recorder changer, Curtis Mathis Cabinet, \$75 OBO. 488-3588.

LQ printer, wide carriage, tractor feed, \$150.00. 326-1483.

ITT 286 computer, color monitor, 1 FD, 20 MB HD, \$700.00. 282-4283 or 554-4942.

800K FD (Internal) for a Mac II, hardly used, \$150.00. Sunil, 283-4329 or 480-4270.

8-ch stereo mixer (KMD MC-802), less than two yrs old, incl custom case, ex cond, \$500. 532-3515.

AT&T 6300 computer, 640K RAM, 30 MB hard card, 2 360K FD, game port/card, 8087 coprocessor, color graphics monitor, \$600 OBO. Keith, x38024 or 554-4309.

New Macintosh 12" RGB monitor, \$399.00. Greg, 283-5470.

ATI VGA Wonder Card with 512KB memory. VGA and SVGA compat, 640x480 and 800x600, 256 colors, 1024x768, 16 colors, displays CGA (640x200) and EGA (640x350) on RGB, RGBI, and TTL monitors, software drivers for Windows 3.0 and others, DEM documen incl, \$160. David, x32751 or 326-1069.

Infinity Quantum Jr speakers, 12" 3 way, \$400 OBO. 997-2069.

Lotus 1-2-3 Release 3 on 3.5 in disks, unopened, \$250. x35496 or 480-3096.

Complete Apple IIc computer system: mono monitor w/stand, scribe printer, joystick, MIDI I/S, Appletworks 2.0, carrying case, many games, ex cond, all manuals, \$400. 422-5951.

Musical Instruments

Bundy clarinet w/case, ex cond, \$150. Ethel, x36148.

Ventura elec guitar, Gibson amplifier, \$200. OBO. Doug, 333-6424.

Alvarez Yairi guitar w/hardshell case, \$500. Brad, x37653 or 488-4989.

Two clarinets, ex cond, good starter instruments, \$150. x30974.

Fender Stratocaster, std, made in USA, white gun metal blue, ex cond, w/case, Marcelo, 335-2378.

Allen theater compact organ, walnut finish w/bench and tone cabinet, \$750 OBO. 488-1262.

Pets & Livestock

AKC golden retriever puppies, born 4/1/91, parents on premises, m/f, \$175. Kelly, x31967.

CFA Persian kitten, blue male, flat face, \$200, ready in May, will hold. 339-2792.

Weimaraner, silver/gray, AKC reg, 6 mos, neutered, shots, m, \$150. x37950.

Household

Norge dryer, single heat, \$25 OBO. 282-4271 or 996-9646.

King sz bed, 3 pc set incl new Cargo head/foot boards, \$400. 474-4663.

'88 sofa and matching chair group, \$300 OBO; asst marble inlay tables (coffee, end, drum) and credenza, \$75 ea. 488-3588.

Walnut/cane/glass coffee table and 2 end tables, \$200; framed posters, \$25-\$50; baskets & throw pillows under \$10. 480-3017.

Kenmore, 30", gas stove, white, plain model, works fine. \$50. 339-1337.

Amana 19.2 cu ft side by side ref./frz w/ice maker, avocado green, \$225; Rangemaster 30" ducted range hood w/light and h/low fan spds, avocado green, mating backdraft damper incl, \$25 for both. Charles, x31153 or 483-2940.

New Hotpoint gas stove, auto ignition \$250 OBO. 992-1399.

Sears Kenmore refrig, 3 yrs old, good cond, side-by-side, 20 cubic feet, ice maker, warr, \$600. x36490.

Formal sofa & loveseat, cream w/rnaue & sealoam, 8 mos old, was \$1600, now \$750 OBO. 482-5462.

Solid wood mirrored dresser \$100; two book cases \$75 ea; two end tables \$25 ea; Kenmore washer \$75. 488-5437.

Kirby tradition upright sweeper, ex cond, all attach, carpet shampooer, \$200. 280-8746.

King sz wtrbd, dark pine, padded rails, liner, matt, heater, pad, ex cond, was \$390, now \$250. Ted, 282-2808, or Allison, x34314.

Lg white Imperial upright freezer, 1 yr old, ex cond, \$500, or trade. Mike, 333-6821 or 332-9932.

Side by Side refrig w/ice maker & new compressor, \$350 OBO. 326-2221.

Caribbean style sofa bed, \$100; teakwood bar w/4 stools & electrical outlets \$350; sz 10 tea length rabbit coat, \$100; twin sz matt & box spring, \$30.00; tube light & fixtures, \$30 for 2 sets; Tiffany style, dbl sz head/footboard, needs refinish, \$30; dbl box spring & matt, \$100; ice cream parlor set table w/2 chairs, needs work, \$40.00. Anna, 559-3133.

Dinettable w/leaf, \$100; sofa bed, \$50; girl's canopy top bed, \$100. 282-4255.

Ethan Allen bookcases, corner desk units, ex cond, \$75 ea. Chuck, x36343 or 333-4795.

Lg 9-dwr dresser, \$50; sm glass top end table, \$10. x30280.

White metal enameled day bed, matt, comforter, pillows, shams, ex cond, \$175; Peden parquet top coffee table, 46" square x 15" tall, good cond, \$75; Jenn-Aire elec range, convection oven, access incl, grill, butcher block cutting boards, wok, \$600. Kay, 998-9482 or 283-9323.

New octagon glass-top table, 2/4 cushioned chairs, \$120.00. Shawn, 472-7526 or x38340.

Cherry BR suite, dbl bed w/hd/bd, footbd, box sprgs, matt, dbl dresser w/mirror, night stand w/dwr and shelf, \$250. x30974.

Antique green BR suite, full sz bed, mirrored dresser, 5-dwr chest, 2 night stands \$650; GE dishwasher w/pot scrubber, almond built-in, 10 yrs old, needs adjustment, \$60. Magdi Yassa, x38470 or 486-0788.

Thomasville pecan DR set, table w/4 chairs, buffet \$400; sofa and chair, beige, brn and white, \$200. Robert, x33742 or 554-6631.

New queen sz mattress/boxspring, extra-firm, was \$699, now \$350. Carol, 286-7619 or x34279.

Photographic

Canon A-1 camera w/50 mm 1.4 Canon FD lens, camera case, Canon 35-70 mm FD lens w/case, Soligar 2x extender w/case; Tiffen Sky 1-A 52 mm filter, ex cond, all \$500. Keith, x33501 or 486-9700.

Minolta X-700 camera, 50 mm 1.1.7 lens, 80-200 mm 1:4.5 macro lens, auto 280PX flash, camera bag, ex cond, \$250.00. Jay, 929-7134 or 481-2335.

Wanted

Want floor polishing machine in good working cond. J. Forero, x32810.

Want to Lease 3-4 BR house near JSC, univ professor to occupy 29 May 91, \$700-800 range. (205) 752-9909.

Want 16 mm (w/sound) movie projector. Parker, x35178.

Want motorcycle, 750 or bigger well-maintained, kept inside, reasonable. Bruce, 485-0396.

Want non-smoking, tidy, female roommate for CLC house, beginning June 1, near swimming pool, 15 minutes to NASA; \$325.00/mo + 1/2 util. Diana, 280-9726.

Want late model 30" to 35" motorhome to rent 2 wks late June. Don, x38039 or 333-1751.

Want roommate to share old house, Clear Lake Shores, M/F, W/D, lg fenced yard, \$250 plus 1/2 util. Steve, 333-7819 or 334-1953.

Want roommate, non-smoker, no pets, 2-2.5 condo on the lake, \$300/mo plus 1/2 util, avail June. 326-2989.

Want ceramic tile any amounts; good motor for 82 Datsun Stanza; 10 hp elec start gas engine, '79 Chev PU hood. 332-1811.

Want late model 30" to 35" motorhome to rent 2 wks late June. Don, x38039 or 333-1751.

Want roommate to share old house, Clear Lake Shores, M/F, W/D, lg fenced yard, \$250 plus 1/2 util. Steve, 333-7819 or 334-1953.

Exploring Inner Space

Spacelab Life Sciences-1 experiments will peer into workings of human body during space flight

[Editor's note: This is the first of two articles explaining the wide range of experiments on the upcoming STS-40 Spacelab Life Sciences-1 mission. Part 2 will be published next week.]

By Kari Fluegel

Since mankind first ventured beyond the boundaries of Earth, medical researchers have explored the limits and capabilities of the human body in space.

Still, 30 years after Alan Shepard crossed that first threshold, many realms of research remain to be explored. That exploration will continue with the broad range of human experiments to be conducted on Spacelab Life Sciences-1.

"This will be new science, answering questions that we never before had the chance to answer," said Howard Schneider, mission scientist for SLS-1.

SLS-1 is the first space shuttle mission dedicated solely to life sciences research. With the help of the STS-40 crew, the 18 investigations will study the cardiovascular, cardiopulmonary, musculoskeletal, immunological, metabolic and neurovestibular systems.

"These are the systems that display the most pronounced changes in space flight," Schneider said, "however with the sophistication of the Spacelab there may be other phenomena revealed that we may want to study for long-duration space flights."

More than 200 people from the United States, Australia, Canada and Switzerland, are participating in the science data analysis, Schneider said. The 17 principal investigators are recognized experts in their fields, he added.

Activities involving the 10 human experiments on-board *Columbia* are managed at JSC. Preflight baseline data was collected here primarily, with several tests scheduled at the Kennedy

Space Center just prior to launch. Investigators will perform postflight tests at the Ames-Dryden Flight Research Facility.

The data gathered in the nine days of STS-40 will fill the pages of research annals for years to come and will help investigators begin to unravel the mysteries surrounding human space flight.

"We hope to get some answers to questions that we have not yet been able to answer," Schneider said. "We also hope to understand the basic physiological response in the zero-gravity environment and to establish countermeasures to assure the health and well-being of flight crews on longer duration missions."

Experiment 022

"Influence of Weightlessness Upon Autonomic Cardiovascular Controls" will investigate the theory that the increased instability of heart rate and blood pressure during space flight may occur because the normal reflex system regulating blood pressure behaves differently in space flight.

For Experiment 022, some SLS-1 crew members will wear neck chambers resembling whiplash collars that will apply various pressures to the neck artery and measure the reflexes of the system that regulates blood pressure. Investigators will take blood pressure measurements before and after the flight for comparison. Astronauts will take the same measurements themselves on orbit to map out changes that occur during space flight.

The experiment is led by Dr. Dwain L. Eckberg, a professor of medicine and physiology at the Hunter Holmes McGuire Department of Veterans Affairs Medical Center and Medical College of Virginia at Richmond.

Experiment 066

Just how rapidly astronauts become accustomed to microgravity and then

readjust to the normal gravitational forces on Earth is the focus of the "Inflight Study of Cardiovascular Deconditioning."

By analyzing the gas composition of a mixture that the STS-40 astronauts "rebreath," investigators will calculate how much blood is being delivered by the heart to the body in space. The experiment uses a non-invasive technique of prolonged expiration and rebreathing — inhaling previously exhaled gases — to measure the cardiovascular and respiratory changes. The technique furnishes information on functions including the amount of blood pumped out of the heart, oxygen usage and carbon dioxide released by the body, heart contractions, blood pressure and lung function.

Astronauts will perform the rebreathing while resting and while pedaling on an exercise bike to provide a look at the heart's ability to cope with added physical stress. On the first and last days of STS-40, only resting measurements will be taken. Rest and graded exercise measurements are made on all other days.

Principal investigator for Experiment 066 is Dr. Leon Farhi chairman of the Department of Physiology at the State University of New York at Buffalo.

Experiment 192

One of the principal features of the body's characteristic response to weightlessness is a shift of body fluid from the legs to the head and upper torso. This is followed by a loss of water and salts from body fluids. Experiment 192, "Fluid-Electrolyte Regulation During Space Flight," will further understanding of how such changes are controlled by hormones of the endocrine system.

The amount and distribution of body water, as well as many of the substances that are constituents of body

fluids, are under the control of the organs and systems that make up the endocrine system.

Investigators hypothesize that the changes in fluid and electrolytes observed in space flight are directly controlled by the endocrine system in a predictable way.

The four measurements used in the experiment are hormone levels in blood and urine; concentration of ions, such as sodium and potassium, in blood and urine; changes in blood volume, extracellular fluid volume and total body water; and changes in blood flow to the kidneys and changes in the rate at which the kidneys filter substances from the blood.

Measurements, which will require numerous blood and other body fluid samples, will be taken preflight, inflight and postflight. Experiment 192 and related experiments also will involve the intravenous injection of a number of tracers during the inflight period.

Investigators expect that the inflight measurements will reveal the earliest changes that occur and will constitute a more accurate assessment of the changes than ground-based measurements alone.

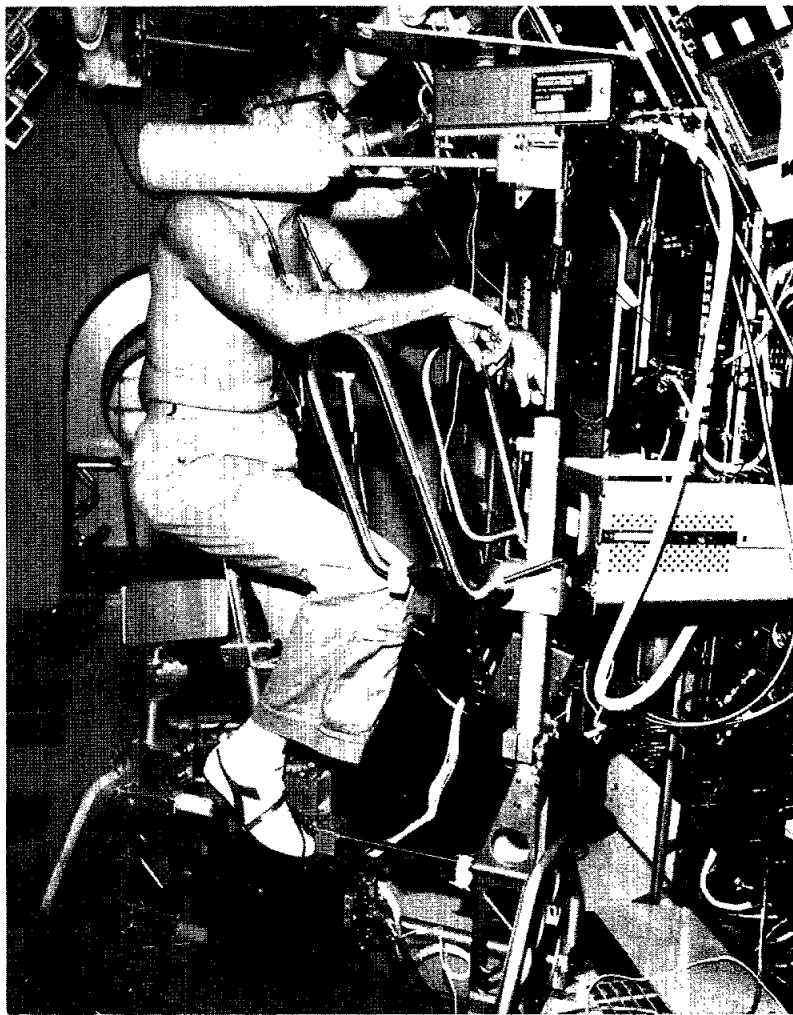
Principal investigator for Experiment 192 is Dr. Carolyn S. Leach-Huntoon, JSC's director of Space and Life Sciences.

Experiment 198

"Pulmonary Function During Weightlessness" provides an opportunity for study of the properties of the human lung without the influence of gravity.

In the microgravity of Spacelab, a model of lung function will be developed to serve as a basis for comparison for the normal and diseased lung.

Led by Dr. John B. West, a professor of medicine and physiology and chief of the Division of Physiology at the Department of Medicine at the University of



Left: An ergometer, or exercise bicycle, will be used for several cardiovascular and cardiopulmonary tests during the nine-day flight. Backup payload specialist Robert Phillips uses the bike in training procedures.

Bottom left: Mission Specialist James Bagian inhales a pre-determined gas mixture during training for a pulmonary function experiment. Bottom right: Payload Specialist Millie Hughes-Fulford and backup Phillips practice operations with the baroreflex neck pressure chamber, a collar that stimulates the baroreceptors in the carotid artery.

California at San Diego, Experiment 198 consists of a series of eight breathing tests with measurements taken after breathing various test gas mixtures. The test assembly allows the subject to switch from breathing cabin air to inhaling premixed gases in separate breathing bags. Breathing exercises involve the inhalation of gas mixtures including oxygen, trace concentrations of carbon monoxide, argon, nitrous oxide and nitrogen.

The tests are designed to examine the distribution and movement of blood and gas within the pulmonary system and how these measurements compare to normal respiration. By measuring gas concentrations, the flow of gas through the lungs into the blood stream and the rate of blood flow into the lungs investigators hope to isolate irregularities caused by gravity and come to a better understanding of the perfectly efficient, healthy lung.

Experiment 294

"Cardiovascular Adaptation to Zero Gravity," will focus on the acute changes in cardiovascular function, heart dimensions and function at rest, during exercise and cardiovascular control mechanisms.

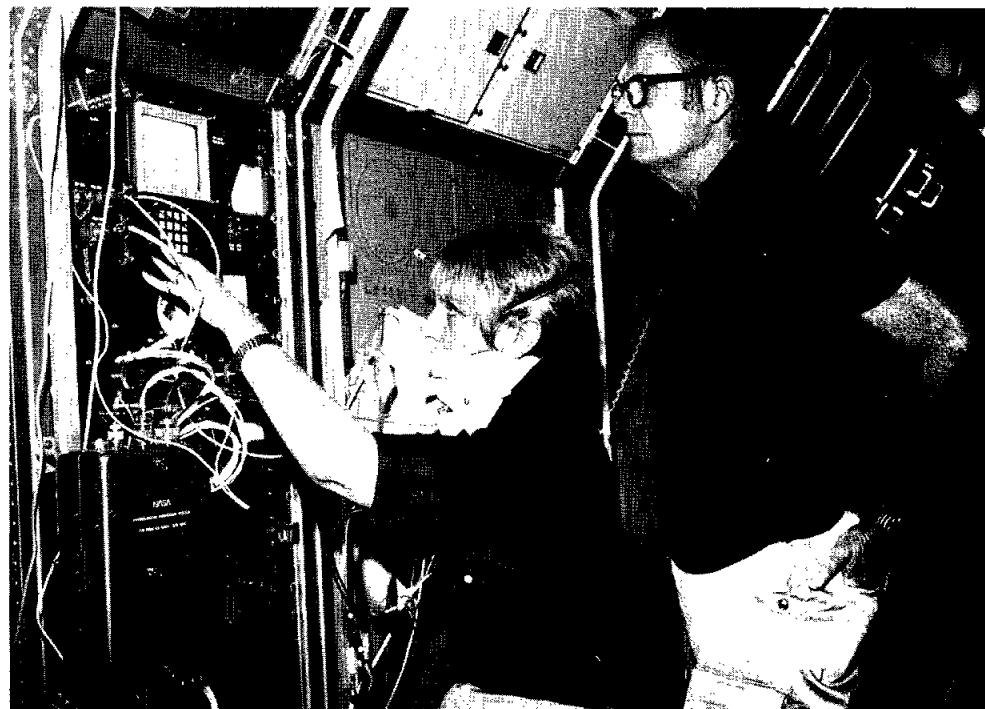
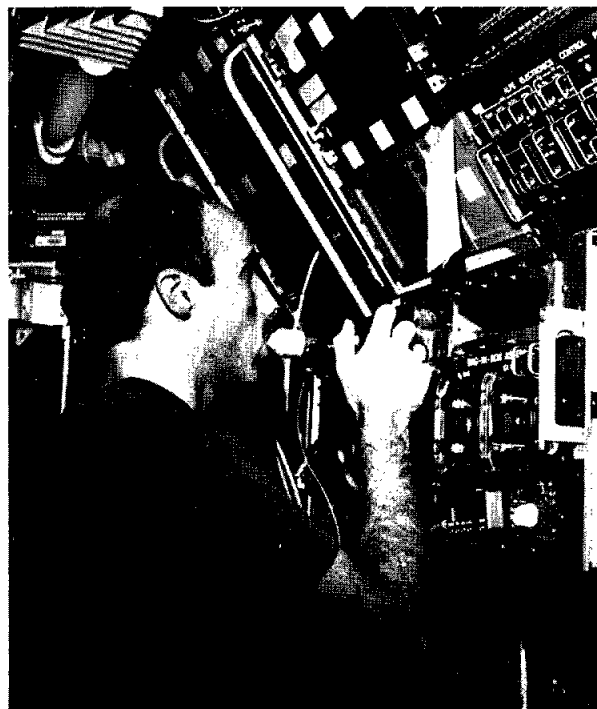
The experiment seeks to increase understanding of microgravity induced changes in the cardiovascular structure and function that cause orthostatic hypotension, or the inability to maintain normal blood pressure and flow while in an upright position, upon return to Earth from the space environment.

Central venous pressure, measurements of changes in the blood pressure in the great veins near the heart, will be observed in one crew member. A cardiologist will insert a catheter into a vein in the arm and position it near the heart prior to flight. Measurements then will be recorded for 24 hours beginning prior to launch and extending for at least four hours into the flight at which time the catheter will be removed. The catheter data will indicate the degree of body fluid redistribution and the speed at which the redistribution occurs.

Echocardiograph measurements, an ultrasound imaging technique, will be performed on crew members each day.

Flow and compliance measurements will gather information on leg blood flow and leg vein pressure-volume relationships. During flow measurements, blood flow in the veins of the leg will be stopped for a short period of time by inflating a cuff above the knee. Compliance measurements, the amount of blood that pools for a given increased pressure in the veins, will be obtained by inflating and incrementally deflating the cuff over different pressures and holding that pressure until the volume of the leg reaches an equilibrium.

Dr. C. Gunnar Blomqvist, principal investigator, is professor of internal medicine and physiology at the UT Southwestern Medical Center.



Dunbar distinguished UH alumnus

Astronaut Bonnie J. Dunbar has been named one of this year's two University of Houston distinguished engineering alumni.

Dunbar, who received her doctorate in biomedical engineering in 1983 at UH, was recognized for her participation as a space shuttle mission specialist on STS-61A and STS-32. She will be payload commander on STS-50, scheduled for launch in June 1992.

Dunbar will be honored at an awards dinner June 7 at the Four Seasons Hotel.

Blackshear honored for volunteer work

Donna Blackshear, a budget analyst in JSC's Lunar Mars

Exploration Program Office, is receiving accolades for both her professional and volunteer work.

JSC

People

Blackshear will receive recognition in the July issue of Dollars & Sense magazine as part of its Tribute to African-American Business and Professional Men and Women. The award will be presented at an awards banquet Aug. 22-25 in Chicago.

Blackshear also has earned recognition as one of 47 Leadership Houston Class IX volunteers who have been working in the

Acres Home Community of north Houston.

The project includes development and construction of a community garden and career enhancement and education programs for students at M.C. Williams Middle School.

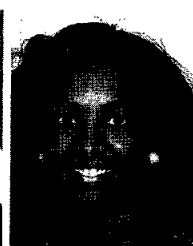
Leadership Houston is sponsored by the Greater Houston Partnership.

Mason-Korecki accepts Headquarters rotation

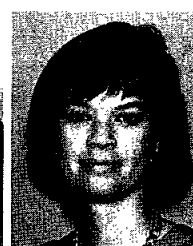
Jennifer Mason-Korecki, a policy analyst in the Project Planning and External Affairs Office of JSC's New Initiatives Office, begins a rotation at NASA Headquarters this month.



Dunbar



Blackshear



Mason-Korecki



Nixon

Mason-Korecki will be a policy analyst in the Office of Policy and Plans for the Office of Space Flight until the end of August. Her primary job will be to assist in the development of an OSF strategic plan and process.

Nixon elected president of honor society chapter

Shirley Nixon, a secretary in JSC's Engineering Directorate, has

been installed as president of the Alpha Beta Sigma Chapter of Phi Theta Kappa.

PTK is a nationwide society of honor students attending community and two-year colleges. Nixon attends San Jacinto College evening classes at the Clear Creek extension in pursuit of a business degree.

Kim Rhyne of Barrios Technology is the outgoing chapter president.

Mission Control viewing hours

The Mission Control Center viewing room will be open to JSC and contractor badged employees and their families during portions of STS-40.

Based on a 7 a.m. CDT Wednesday launch, employees will be allowed to visit from 11:30 a.m.-2 p.m. and 5-7 p.m. May 25, 11:30 a.m.-2 p.m. May 24, 2-5 p.m. May 25 through 27, 11:30 a.m.-2 p.m. and 5-7 p.m. May 28, 11:30 a.m.-2 p.m. May 29, and 11:30 a.m.-2 p.m. and 5-7 p.m. May 30.

Viewing times may change with little notice. Call the Employee Information Service at x36765 for the latest information.

The Bldg. 3 cafeteria will be open from 7 a.m.-4:30 p.m. weekdays and 11 a.m.-4:30 p.m. weekends and holidays. The Bldg. 11 cafeteria will be open from 6:30 a.m.-2 p.m. weekdays and 7-10 a.m. weekends and holidays.

STS-39 crew plans employee briefing

STS-39 crew members will discuss the highlights of their recent nine-day mission on *Discovery* during the first unclassified Department of Defense mission.

The presentation, open to all NASA and contractor employees, will be at 1 p.m. Monday in Teague Auditorium.

Commander Mike Coats led the seven-member crew consisting of Pilot Blaine Hammond and mission specialists Guy Bluford, Rick Hieb, Lacy Veach, Greg Harbaugh and Don McMonagle.

Discovery was launched from the Kennedy Space Center on April 28 and landed in Florida May 6. During the mission, the crew worked with Air Force Program-675 and the Infrared Background Signature Survey.

JSC's Juneteenth celebration nears

A picnic sponsored by the Black Programs Committee of JSC's Equal Opportunities Programs Office will commemorate Juneteenth, the day Texas blacks received official word of the Emancipation Proclamation.

Spurgeon Robinson, vice chairman of the BPC, said the committee is fine-tuning the final preparations for the picnic scheduled for 4:30 p.m. June 21 at the Gilruth Center pavilion.

Possible activities include bridge and domino tournaments, volleyball, horseshoes and balloon tosses.

Committee members are Lebarian Stokes, Jackie Wilson, Preston Lewis, Renee Julian, Pat Burke, all of NASA; Roslyn Barnett, CSC; Charles Greer, IBM; Howard Mosely, Jefferson; Emmerson Edwards, Rockwell; and Lois Ramey, Boeing.

Tickets are available from Pat Burke in the Equal Opportunity Programs Office in Bldg. 1, Room 172.



UNTIE A YELLOW RIBBON—It was a different kind of ribbon-cutting ceremony this week for JSC's Rod Etchberger, a Procurement Operations Branch employee who's just returned from the Persian Gulf war. Etchberger's co-workers gathered to watch him cut the yellow ribbon they had tied around a tree outside Bldg. 45. Ten of the 20 JSC reservists who served in Operation Desert Shield and Desert Storm have returned to work so far.

JSC Photo by Jack Jacob

Muratore earns prestigious award

(Continued from Page 1)

Through the efforts of Muratore and a talented team of JSC computer applications experts, systems based on artificial intelligence are beginning to assist NASA flight controllers in space shuttle decision-making by applying logic to raw data and producing comprehensive information.

"The intent is to provide the flight controller with a knowledgeable associate in the decision making process," said Muratore.

The team's efforts to upgrade existing MCC technology with expert systems began in 1986. The first system developed under Muratore's leadership, the Integrated Communications Officer Expert System Project (IESP), was recognized by the American Association of Artificial Intelligence as "one of the most innovative applications of artificial intelligence in America."

Expert systems applications developed since then are now supporting a variety of

flight disciplines including guidance, navigation and control (GNC), the payload development and retrieval system (PDRS) and data processing systems (DPS).

Flight directors now can rely on assistance in making deorbit and landing decisions based on immediate updates to wind conditions at primary landing sites using an expert system that provides information on wind speed and direction at altitude and on several runway surfaces simultaneously.

"The emphasis for us has been the idea of using artificial intelligence techniques to ensure that we maintain high-quality flight decisions," Muratore said. "Mission Control is going to change in the next few years, just due to the dynamics of the population of the agency. And then with the space station program coming on, we're going to transfer a lot of talent to space station. The question is, will we get in front of the change and try to get some tools to maintain the quality of what we're doing."

Spacelab crew prepares for busy mission

(Continued from Page 1)

work in the laboratory.

The orbiter crew will participate as subjects in five of the 18 primary experiments, but not in any invasive experiments that might hinder their ability to operate the shuttle.

The crew has gone through extensive preflight testing to establish baseline data for the experiments, and will undergo in-depth postflight examinations at Ames-Dryden Flight Research Facility at Edwards, Calif.

"There has been probably as much testing for this crew as any in history," Bagian said.

The baseline data, Seddon said, is derived by taking blood samples, collecting urine, monitoring calorie and nutrient intake and performing the same experiments that will be performed during the flight. After data on

how the body reacts in weightlessness has been collected, similar information will be collected postflight to measure how quickly everyone returns to normal.

"Certainly, the human body has shown that it's able to adapt pretty well to space flight," Bagian said. "A lot of the problems deal with coming back, the rapid transition back to a weighted environment."

The "people mover" or Crew Transport Vehicle, will be used for the first time when *Columbia* lands at Edwards Air Force Base. In an effort to minimize the effects of gravity on the crew members when they return to Earth and the provide immediate access for medical technologists, they will be moved to the Ames-Dryden clinic in the CTV while seated in reclining captains chairs. Their

egress won't be visible.

Gaffney, who will be the first person to fly with a catheter inserted through his arm to a position near his heart, said the experiments will look both at how quickly the body adapts to space flight, and how quickly it readapts to Earth. This will be the first time physicians have been able to study the initial transition.

"Why did the mineral leave the bone structure? Why did the muscles waste away despite three or four hours of exercise a day? Why does it take so long to get your balance back?" Gaffney asked. "Those questions can only be answered and the countermeasures developed if we understand the mechanisms."

Of particular interest is the heart and the system of arteries and veins that carry blood to the various parts

of the body.

"The cardiovascular system, which is near and dear to my heart, is going to be a major area of interest and emphasis on the mission," Gaffney said. "It looks at how the body of a crewman adapts to weightlessness. By doing that, you get a good idea of how a normal system handles fluid shifts, how its pressure control mechanisms adapt."

Seddon said she is especially interested in whether men and women react differently.

"Right now, we don't really know if there are any differences in women's physiology we might see," she said. "I'm looking forward to being able to bring back good data so that we can say definitively that women have a place in the space stations and the exploration of the future."

JSC workers Employees of the Year

Three JSC workers received Employee of the Year awards last week at the annual Federal Executive Board/Federal Business Association awards banquet.

Humbolt C. Mandell Jr., acting deputy manager for the Lunar and Mars Exploration Program Office and manager of that program's Development and Control Office, received the award in the supervisory category.

Mandell was cited for his unique capabilities and experience in the planning and implementation of successful space programs. The work of his organization has been instrumental in the selection of program alternatives, shaping conceptual designs for vehicles to take humans back to the Moon and on to Mars.

Within a year of his assignment to the Development and Control Office, which is responsible for budgeting, program control, program planning and program development for the entire Space Exploration Initiative, Mandell was named acting deputy in the program office.

Dorothy A. Childress, a secretary in the Administration Directorate's Space Station Systems Procurement Branch, earned the clerical/service category award.

She has clerical responsibility for one supervisor, two contracting officers, five contract specialists, one office education student and one cooperative education student and all of the typing, timecard preparation, filing, calendar maintenance and action tracking that goes with it.

She was cited specifically for her outstanding effort in typing the 300-page contract to support the transfer of Space Station *Freedom* Program Integration from Reston, Va., to JSC. In spite of many obstacles, the job was completed on a tight schedule.

Andrew R. Patnesky, a photo documentation specialist in the Public Affairs Office's Media Services Branch, received the length of service award. He will have 52 years of federal service on Oct. 10, 1991. He served in the U.S. Air Force from August 1939 to August 1960, then worked for the Air Force as a civilian from October 1960 to December 1961 before transferring to NASA.

The awards were presented at a May 8 luncheon at the Sheraton Grand Hotel in Houston.



Mandell



Childress



Patnesky