

# Space News Roundup

Vol. 32

February 1, 1993

No. 4

## Study may advance space flight, cancer research

By Kari Fluegel

Hidden away in one of *Endeavour's* mid-deck lockers during the STS-54 flight was a small experiment that may affect astronauts and cancer patients alike by becoming an important tool in the evolving world of biotechnology.

Designated as DSO 322 Biotechnology Specimen Temperature Controller, the joint NASA and University of Texas M.D. Anderson Cancer Center experiment was designed to investigate if human white blood cells, also known as lymphocytes, moved in microgravity.

Understanding this movement, or lack

thereof, is a vital step for cancer researchers to determine how to help lymphocytes penetrate tissue to kill tumors. This is important because the lymphocytes fight cancers and all types of infection by moving into the diseased area. In the case of cancer, however, researchers have discovered that the closer a lymphocyte gets to a tumor, the more impaired is its movement.

"This means that the basic mechanism to fight tumors is lost," said Glenn Spaulding, manager of JSC's Biotechnology Program.



Interest in flying a shuttle experiment to look at human lymphocyte movement began when tests in JSC's rotating-wall bioreactor suggested immunological anomalies. The rotating-wall vessel, developed at JSC, suspends cells and tissues in a free-fall situation, counteracting the effects of gravity, thereby simulating microgravity. Developed as a tool for Space Station *Freedom*, it is being used

in several Earth-based investigations. DSO 322 consisted of healthy lymphocytes provided by a Florida blood bank inserted into

small cubes of collagen to simulate tissue. Once on orbit, crew members activated the experiment and lymphocyte movement was analyzed.

Researchers are still studying and confirming the STS-54 data, but early analysis looks promising, Spaulding said. Meanwhile, the experiment is scheduled to fly again on STS-56.

Principal investigators are Dr. Neal Pellis of the M.D. Anderson Cancer Center, Spaulding and Thomas Goodwin of Krug Life Sciences. The hardware was developed by David Smaistrila, Dan Svercek, Laura Fleer, Art

Please see **STUDY**, Page 4

## Black History Month focuses on activists

Also looks at leaders, scholars and writers

"Afro-American Scholars, Leaders, Activists and Writers" will be the focus of special activities during JSC's observance of Black History Month during February.

Each Thursday in February, Channel 3 of the JSC Television System will feature film presentations at 11:30 a.m. Films include this week's on "Brown vs. Board of Education;" "The Life of Sojourner Truth: Ain't I a Woman," Feb. 11; "A Day to Remember: Aug. 28, 1963," Feb. 18; and "Prejudice: Dividing the Dream," Feb. 25.

The annual Black History Month Luncheon is set for 11:30 a.m. Feb. 19 in the Gilruth Center Ballroom. The featured speaker will be Curtis L. Franklin, a petroleum traffic analyst for Conoco and noted speaker on black history.

Luncheon tickets cost \$8 and must be purchased by Feb. 16. Tickets are available from Crystall Mullen, x47432; Mark Falls, x88627; Tamyra Martin, x34502; Patricia Burke, x30601; Judy Hollie, x36028; Danny Harwell, x39155; Beverly Green, x38057; Marie Miller, x38694; Norfleet

Please see **BROWN**, Page 4



Brown



JSC Photo by Bill Blunck

JSC officials prepare to cut the ribbon, officially opening Bldg. 111. From left are Human Resources Director Harv Hartman, Administration Director Bill Kelly, Procurement Director Gene Easley and Center Operations Director Ken Gilbreath.

## New building provides easy access

The new Bldg. 111 is now open to the public at JSC's front gate, providing the public easy access to industry and employment assistance without the hassle of obtaining a temporary badge.

An open house and ribbon-cutting ceremony marked the official opening of the new building, adjacent to the Security Office at the Second Street entrance, on Jan. 22.

The Industry Assistance Office will provide counseling to businesses seeking advice on how to best pursue contracting opportunities with NASA. Industry Assistance will help businesses get on solicitation mailing lists, learn about current and planned procure-

ment opportunities, make arrangements for meetings with technical requirements personnel and explain various assistance or preference programs which might be available.

In addition, a bid board where JSC's current solicitations are available for inspection by prospective contractors will be maintained.

The JSC Employment Office also has relocated to Bldg. 111 from Bldg. 45, making it more convenient for applicants to stop by and get employment information or drop off applications. The office will continue to pro-

Please see **NEW**, Page 4

## ACRV Project Office begins life on its own

The Assured Crew Return Vehicle Project Office is spinning out of JSC's New Initiatives Office to begin adapting the Soyuz TM spacecraft for use as a Space Station *Freedom* "lifeboat."

The move follows Space Station *Freedom* Director Dick Kohrs' decision to delegate to JSC the responsibility for managing the ACRV Project and evaluating Soyuz use.

Jerry Craig will remain in charge of the new organization, currently comprised of about 20 people. The new office will manage definition and development of the ACRV system, system interfaces, operations integration, and programmatic aspects.

For the past year, the ACRV Project Office has been investigating the feasibility of using the Soyuz as an emergency return vehicle when the space shuttle is not docked at *Freedom*. In December, Arnold Aldrich, NASA's associate administrator for space systems development, and Yuri Semenov, general director and designer for NPO-Energia, signed an agreement to continue studies of the concept.

The new office will proceed with detailed systems planning and Soyuz modification studies this year in anticipation of its development in fiscal year 1994.

Four subordinate organizations will be formed to help the new project office accomplish its mission:

- The Systems Engineering and Integration Office will define and control all systems requirements and interfaces;
- The Project Engineering Office will define and manage all system hardware elements and end items;
- The Operations Integration Office will be responsible for the overall integration of operations concepts and plans; and

Please see **ACRV**, Page 4



Craig

## Columbia almost ready for fuel tank, boosters

By James Hartsfield

Work on *Columbia* in the processing hangar is being wrapped up this week, and NASA's oldest shuttle is set to be moved from the hangar to Kennedy Space Center's Vehicle Assembly Bldg. on Tuesday or Wednesday.

After being linked with the fuel tank and solid rocket boosters for STS-55, *Columbia* is scheduled to be moved to Launch Pad 39A next week.

Last week, technicians closed out preparations of the crew cabin, the engine compartment and the German-United States Spacelab-D2 module. On Saturday, *Columbia's* cargo bay doors were closed in preparation for the move. Before mounting the orbiter on the roller used to move it to the VAB, the spacecraft also was weighed and its

center of gravity checked.

Elsewhere, *Endeavour*, fresh from space and STS-54, went through a series of post-flight mechanical inspections last week. The cargo bay doors were opened and work to remove the Diffuse X-Ray Spectrometer began.

*Discovery*, scheduled to loft the Atmospheric Laboratory for Applications and Science for its second trip to space in late March, is being prepared in the Bay 3 processing hangar. This week, work will center on installing the three main engines, the forward reaction control system steering jets, and the drag chute.

*Atlantis* remains in Palmdale, Calif., at the Rockwell shuttle factory undergoing a period of major inspections and upgrades. *Atlantis* will not return to Florida until early October.



JSC Photo by Robert Markowitz

**GETTING ACCLIMATED**—Russian Cosmonaut Vladimir Titov, left, finishes up his first T-38 familiarization ride with JSC Pilot Roger Zwieg at Ellington Field. Titov and fellow cosmonaut Sergei Krikalev are beginning training for a flight on the STS-60 shuttle flight in November.

## Car pooling saves spaces, environment

JSC's Security Division has issued a reminder that the center does have a car pooling program that can get drivers a reserved parking space near their building.

Charlyne Minick, the center's traffic manager and the person in charge of the program, said more than 20 car pool groups are taking advantage of the JSC Carpool Program, which reserves parking spaces for groups of three more employees who commute to work together each day.

"If we can get three people instead of one using one vehicle, it really benefits everyone because it helps the parking situation and the environment," Minick said.

Any civil service, contractor or military personnel whose duty station is JSC may participate in the program. For more information, call the Security Division at x34441.

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. For more information, call x35350 or x30990.

Sleeping Birdie (10:30 a.m. Feb. 13, Summit): \$8, limit 6.

Valentine Dinner Dance (7 p.m. Feb. 13, Gilruth): \$15, tickets go on sale Feb. 10.

EAA Houston Livestock Show and Rodeo (Astrodome, upper level); \$9, limit 4 tickets. Call x35350 for dates.

Space Center Houston — Discount tickets: adult, \$7.50; child (3-11) \$4.50; commemorative: \$8.75.

Metro tickets — Passes, books and single tickets available.

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

Entertainment '93 and Gold C coupon books, stamps, Walt Disney Club memberships, business cards, stamps and souvenirs also available.

JSC

## Gilruth Center News

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

**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.

**Defensive driving** — Course is offered from 8 a.m.-4:30 p.m. March 6. Cost is \$19.

**Weight Safety** — Required course for employees wishing to use the Gilruth weight room is offered from 8-9:30 p.m. Feb. 10 and 23. Pre-registration is required; cost is \$5.

**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. Mondays and Wednesdays. Cost is \$24 for eight weeks.

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

**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 Weir, x30301.

**JSC Golf Association** — JSCGA is accepting members for the 1993 season. League fee is \$55; maximum handicap is 36. First tournament is Feb. 20. For more information, call Mike O'Reilly, 283-9242.

JSC

JSC

## Dates & Data

### Today

**Cafeteria menu** — Special: wieners and baked beans. Entrees: beef chop suey, breaded cutlet, grilled ham steak. Soup: beef and barley. Vegetables: buttered rice, Brussels sprouts, whipped potatoes.

### Tuesday

**Blood drive** — JSC will host an on-site blood drive from 8-11:30 a.m. and 1-3 p.m. Feb. 2 at the Gilruth Center. Appointments are required; call Dan Mangieri at x33003, Mary O'Rear at x36531, or Susan Anderson, x33082.

**Lunch and learn** — The American Institute of Aeronautics and Astronautics Automation and Robotics Technical Committee will meet at 11:30 a.m. Feb. 2 in Gilruth Center Rm. 206. Dr. Nazareth Bedrossian of Draper Laboratories will discuss "Control of an Underactuated Two-Link Manipulator." For more information, call Zafar Taqvi at 333-6544.

**Lunch and learn** — The American Institute of Aeronautics and Astronautics Space Imaging and Astronaut Observations Technical Committee will meet at noon Feb. 2 in Bldg. 31, Rm. 129. Dr. Karl Henize will discuss "Image Processing for Orbital Debris Analysis." For more information, call Kam Lulla at x35159, or Michael Snyder, x35171.

**Cafeteria menu** — Special: pepper steak. Entrees: fried shrimp, pork chop with applesauce, turkey a la king. Soup: celery. Vegetables: au gratin potatoes, breaded squash, spinach.

### Wednesday

**Toastmasters meet** — The Space Station Toastmasters Club will meet at 7:15 a.m. Feb. 3 at the House of Prayer Lutheran Church, Bay Area

Blvd. and Reseda Dr. For details, call Jim Morrison at 480-9793.

**Cafeteria menu** — Special: Mexican dinner. Entrees: fried catfish with hush puppies, braised beef ribs. Soup: seafood gumbo. Vegetables: Spanish rice, ranch beans, buttered peas.

### Thursday

**Cafeteria menu** — Special: hamburger steak with onion gravy. Entrees: corned beef with cabbage and new potatoes, chicken and dumplings, tamales with chili. Soup: split pea. Vegetables: navy beans, buttered cabbage, green beans.

### Friday

**Space conference** — The Space Frontier Foundation will sponsor Space Frontier Conference II Feb. 5-6 at the Houston Hobby Hilton. Speakers will include Peter Diamandis, founder of International Space University, and William Gaubatz of the Delta Clipper program. Cost is \$95 for members, \$110 for non-members. For details, call Jerry Drake at 933-7783.

**Cafeteria menu** — Special: barbecue link. Entrees: deviled crabs, broiled codfish, liver and onions. Soup: seafood gumbo. Vegetables: corn, green beans, new potatoes.

### Feb. 8

**Cafeteria menu** — Special: chili and macaroni. Entrees: barbecue sliced beef, Parmesan steak, spare rib with kraut. Soup: French onion. Vegetables: ranch beans, English peas, mustard greens.

### Feb. 10

**Freedom Fighters meet** — The Space Station Freedom Fighters will meet at noon and 5 p.m. Feb. 10 in

Rm. 160 of the McDonnell Douglas Tower, Space Center Blvd. and Bay Area Blvd. For more information, call David Cochran at 482-7005.

**Toastmasters meet** — The Spaceland Toastmasters Club will meet at 7:15 a.m. Feb. 10 at the House of Prayer Lutheran Church, Bay Area Blvd. and Reseda Dr. For more information, call Jim Morrison at 480-9793.

### Feb. 12

**JAS meets** — The JSC Astronomical Society will meet at 7:30 p.m. Feb. 12 at the Lunar and Planetary Institute, Bay Area Blvd. and Middlebrook Dr. Chuck Shaw will present "Winter Dark Sky Objects." For more information, call John Erickson at 335-4278.

### Feb. 15

**Call for papers** — The 1993 Conference on Intelligent Computer-Aided Training and Virtual Environment Technology has issued a call for abstracts due by Feb. 15. JSC will co-sponsor ICAT/VET '93 with the U.S. Army Training and Doctrine Command. Send abstracts of up to 250 words to R. Bowen Loftin, PT4. For exhibits information, call Don Myers, 283-3821. For registration, call x39071.

### Feb. 19

**Black history** — JSC's Black Employment Program Council will sponsor a Black History Observance luncheon at 11:30 a.m. Feb. 19 at the Gilruth Center. Keynote speaker will be Curtis Franklin II, newsletter editor for The Network Group. For more information, call Black Employment Manager Charles Hoskins at x30607.

## Swap Shop

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

### Property

**Sale:** Bay Glen, 3+1-2.5-2, 2150 sq ft, 2 living areas, study, formal dining, 5 yr old, landscaping. Brett Walker, 244-4402 or 488-5813.

**Sale:** South Shore Harbour, 3-2-2, lg island kitchen w/breakfast rm, lg living/dining, deck w/ceiling fan, trees, marble jacuzzi tub, \$115.5K. Bob, x33057 or 538-3431.

**Sale:** Clear Lake Shores, 3-2-3, boat-slip, appraised at \$126,777, sell for \$122.5K. 538-1849.

**Rent:** Galv condo, furn, sleeps 6. Magdi Yassa, 333-4760 or 486-0788.

**Sale:** Dickinson Bayou, 4-2.5-2, pool, 2 story, sec sys, .738 acres, 100 yr old trees, \$229K. x34354 or 337-1640.

**Lease:** Webster condo, 2-1, new paint/carpet, FPL, all appl, patio, avail Feb 1, \$495/mo. 486-0315.

**Rent:** Taos, N.M., ski house, mountain view, sleeps 4, wkly rentals. 532-2082.

**Sale:** Shoreacres, 4-2-2, pool, extra wooded lot, lots of trees, \$89K. 333-7615 or 470-2592.

**Sale:** CLC, 3-3-2, gameroom w/8' pool tbl, glassed to 34' pool, den, formal dining/living, \$101K. 488-4117.

**Lease:** CLC Oakbrook West, 4-2-2.5, 2 story, fenced backyard, \$1050/mo. 486-0776 or 282-6766.

**Sale:** Dickinson, 4-3-2D, study, gameroom screen porch, lg kitchen w/Jennaire, new ceramic tile, util rm inside, \$129.9K. Coy, x39282 or 335-0641.

**Sale:** Crystal Beach lots, 4 lots, \$2K ea. 921-7212.

### Cars & Trucks

'86.5 4 x 4 King Cab Nissan PU, blk, AM/FM/cass, tint windows, 5 spd, ex cond, \$6K; '59 Chevy PU for parts or restoration. 334-2335.

'86 Honda CRX, 5 spd, AC, wht, good cond, high miles, \$2.5K. 326-4456.

'76 Volvo 245DL wagon, blue, auto, AC not working, new tires, \$1.3K OBO. Robert, 488-7728.

'84 Toyota Custom Van, alloy wheels, AM/FM/cass, PS/PW/PL, 134K mi, \$3.5K OBO. x32076 or 286-6046.

'80 Cadillac Fleetwood Brougham diesel, make offer. Keith, x35191 or 332-5170.

'91 Camaro RS, wht, gray int, cass, AC, \$7.9K. 282-4216.

'79 Dodge Aires K LE, 4 dr, 14K mi, wht, \$4K. Doug Fox, 996-6077.

'84 Nissan 300ZX 2+2, auto, AC, cass, cruise, elec mirrors, \$3550. 488-7771.

'79 Pontiac Gran Lemans, V6, auto, 4 dr, loaded, \$1150. x34205 or 488-8105.

'91 Camaro RS, 305 V8, PW/PL, AC, cd player, 38K mi, ex cond, \$11K OBO. Lisa, x34726 or 479-0803.

'83 Olds 88 Royale, good cond. x31610 or 532-1759.

'85 Pontiac Fiero, loaded, blk w/taupe int, good cond, 44K mi, \$3.2K. x30628 or 286-5031.

'84 GMC S-15 longbed PU, good cond, \$3.2K OBO. David, 283-5883.

'86 Pontiac Grand Am, V6, auto, 4 dr, tilt, cruise, new AC compressor, \$3K OBO. Jeri, 333-7552.

'76 Datsun 280Z 2+2, bronze-brwn, 66K mi, \$2.1K. Everett, x36224 or 488-6024.

'73 Datsun 240Z, runs good, \$600. Gary Johnson, x34136 or 488-0353.

'68 Mustang, red, body & int need work, runs good, \$1.3K. 337-4182.

'88 Acura Integra LS, 4 dr, dk gray, auto, AC, AM/FM/cass, tint, ex cond, 65K mi, \$8.5K. Perri, x32605 or 334-1008.

Dodge Colt Vista wagon, ex cond, \$2.3K. x35159 or 486-5247.

'86 Chevy Cavalier RS, 4 dr, auto, tilt, PW/PDL, AC, 140K mi, \$2.3K OBO. x33830 or 996-0876.

'83 Buick Century Limited, 3.0l V6, 83K mi, all maint rec, wht, auto, 4 dr, new carb, 4 new tires, need eng rebuilt, \$295. Jerry, x38922 or 488-5307.

'80 MGB, orig owner, \$2.3K. Kevin, x48910 or 486-3923.

'86 Ford F150 4 x 2 PU, rebuilt long block, 6 cyl, 300 cu in, \$3.5K. 370-2236.

'91 XLT Ext Cab PU, 302, loaded, 40K mi, \$12K OBO. 244-9671 or 997-1887.

Tractor, Ford, 3 cyl, diesel, 430 hrs, 7 implements, \$8750. 946-1923.

'65 Ford Mustang coupe, 6 cyl, auto, new brakes, runs good, ex body, \$2K. Rick, 332-5745.

'90 Geo Storm, blk, 2 dr, auto, AC, PS/PB, AM/FM/cass, 35K mi, transferable ext warr, 3 yr/65K mi, tint, \$7.2K OBO. Mike, x34318.

### Boats & Planes

24' Sears Pwr boat, trlr, cuddy cabin, new 350 hp eng, hydraulic trim tabs, ship to shore radio, \$12,995. 482-7546.

'90 16' Kenner, center console, 88 hp Johnson motor-low hours, 22 gal fuel tank, all carpet, \$7.2K. 470-2592.

British Silver Seagull O/B, recoil starter, runs good, \$225. 487-4440.

Windsurfer, 2 sails, fiberglass mast, \$375. Bill, 554-6242.

'93' TF-190 Nitro tracker bass boat, 93' trlr w/brakes, loaded, 91' Yamaha Pro-V 150 hp, \$16K OBO; 80' 14' alum-v-bottom bay boat, trlr, 351B trolling batt, depth finder, 2 seat, live well, it

control panel, bilge pump, \$1K OBO. 997-1887 or 244-9671.

### Cycles

Raleigh Super Course bicycle, ex cond, \$150. 486-3967.

Schwinn 10 spd mens lg sz bike, world model, ex cond, removable front wheel, \$100. 333-7807 or 626-2209.

### Audiovisual & Computers

Two 30 w shelf spkrs, oak, \$40. Frank, 282-3858.

Apple 2c, mono, Applescribe printer, manuals, cables, ribbons, software, \$500 OBO. Wayne, 996-9157.

Sony stereo cab, Pioneer stereo amp, \$50/ea. Mark, x30918.

Macintosh SE, 4 MB, 20 MB HD, \$975. 488-7771.

AM/FM stereo sys w/turntable, solid pecan wood console, \$45. Wally, x38597 or 332-5721.

20 MB HD w/controller for IBM or clone, Lotus 1-2-3 ver 2.2 w/documentation. 280-0502.

Nintendo game sys, 5 games, light gun, 5 Nintendo magazines, was \$260, now \$125; Gameboy w/3 games, \$100. Don, 283-1210 or 486-6726.

Amiga 1000, 1 MB RAM, 5.25, 2 3.25 FD, color monitor, software, \$700 OBO. 337-2671.

AT&T 6300, 20 MB HD, color monitor, \$400. Fox, 333-4460.

Beta videocassettes, .50 cents/ea. 212-1470 or 470-2744.

Commodore 64, no monitor, Star 10x printer, games, word processing programs, \$200. x39631 or 554-4095.

### Pets and Livestock

Emu chicks. 482-0874.

Half Basenji/half blue heeler pups. x33678 or 489-7494.

2.5 yr old male Dachsund, red, AKC reg, \$75. 335-0641.

Free Lab/Golden Retriever pups, 4 f, 3 m. Jeanette, x31555 or 393-1114.

### Musical Instruments

C Bundy flute, \$150 OBO. Jan, x31304 or 280-8096.

Tenor sax, professional Yamaha YTS-52, ex cond, \$975. Jennifer, 333-6362 or 485-4417.

### Lost and Found

Lost camera-Leica M-3 35mm, NASA #ECN601596, lens, 21 mm, ECN 681577. x38636 or 251-7314.

### Household

Dk oak BR set, qn sz hdbd/frame, dresser, mirror, 2 nite stands, \$100; 2 tbl lamps, ceramic and amber glass/brass, \$20/ea. Frank, 282-3858.

Rattan sofa, loveseat, glass top end tbl, coffee tbl, dinette, 4 padded chairs,

\$450. 992-2768.

Matching sofa, chair, gold, good cond, \$150. 992-2304.

Oak tbl, 4 chairs, 54" claw ft, \$650; 2 dressers, ladies w/stool and 40 x 44" mirror, it wood, \$185 for both. 339-1152.

90" SW print couch, peach/blue tones, \$200; lg oak coffee tbl, \$50; Royal elec typewriter, \$50; Radio Shack 13" color tv, \$50. 482-3546.

Qn sz waterbed frame, \$20. Paul, x31883.

Loveseat, ex cond, \$80. Sonia, 335-1607.

Sofa, chair w/ottoman, earth tones, \$150; coffee tbl, \$15; end tbl w/lamp, \$5. x31913.

China cab, buffet/server, tbl, chairs, lg igloo style dog house, elec typewriter. 282-4849 or 409-925-7839.

W/D, stackable, apt sz, \$90; dining rm tbl w/ext leaves, 6 chairs, \$70; sleeper sofa, \$90. Steve, 929-7469 or 782-7658.

Kg sz waterbed w/linens, comforter, \$100; 6' solid wood desk, \$200; high back office chair, \$30; octagon end tbl, \$20; dual floor lamp, \$20; full sz bed/frame, \$30. 486-1469.

Fully uphol DR Parsons chairs, blue velvet, \$150 for 4, \$295 for 8; 4' tint 1 pc glass window w/alum frame, \$65. Claire, 488-5307.

Student desk, \$100; 9 drwr modern dresser/mirror, \$80; end tbl, \$25. 488-0189.

Small wooden coffee tbl, wooden tv stand w/doors, \$12/ea. 333-7315 or 480-5430.

Dining rm tbl, chairs, 42" round extends 62", ex cond. Fox, 333-4460.

Daybed, wht iron, brass knobs, \$160. 554-6200.

Simmons baby bed, matt, ex cond, \$225; baby bed ensemble, Daisy Kingdom bear print, 7 pc, \$50; Cal-King waterbed w/nite stands, \$100. 334-0414.

### Wanted

Want Nordic Track ski exerciser, wht baby crib in good cond. 334-2335.

Want scuba equip, metal detectors, underwater or land; want leather furn, couch, loveseat, recliner, etc. 482-0874.

Want color or mono monitor for XT computer. 992-5745.

Want roommate to split 3 BR house in Middlebrook, gar, jacuzzi, master BR, begin March 1, \$400/mo + 1/2 util. Todd, 244-5359 or 480-0356.

Want roommate to share house in CL, \$275 + 1/3 util and cable, ref and dep required. 334-2684.

Want Apollo 204 accident report, "Moonport History of Apollo Launch Facilities", other NASA history books. Ed, 333-6453 or 326-4746.

Want house to rent in Friendswood, Deer Park, Beltway 8 area, will pay

\$550/mo.; want chival, full length floor mirror w/bevelled glass. Annie, 283-5828 or 998-8897.

Want nonsmoking roommate to share 2-2 home in Piper's Meadow, no pets, 1 have a smal dog, \$300/mo + 1/2 util. Tracy, x32526 or 486-3946.

Want used canoes, kayaks, shells. 474-7883.

### Miscellaneous

Dinette set, matching china/entertainment cabinets, loveseat w/hide-a-bed, other misc. items. Mandy, 283-5997 or 480-1236.

Lg metal office desk, good cond, \$40; 3 jaw lathe chuck 6" dia 1.5 x 8 thds in bore, \$85; high spd motor w/grinder/polisher arbor, \$40; coolant pump w/1/4 hp motor, \$30; elec motors. 921-7212.

Band saw, 10" Craftsman w/metal support stand, 1.5 yrs old, \$135. 332-0397.

Evenflo Ultrara car seat, \$50. 488-7728.

Two roundtrip airline tickets from Ellington Field to Salt Lake City, Utah, Feb 12-18, \$334/ea. Beth, 283-8123.

Infant carseats, \$10, \$25; maternity semi-formal dress, sz 14-16, \$20; 2 casual summer maternity dresses, \$5/ea; FP infant bath, \$5; baby bath seat, \$5; Disney crib gym, \$5. 484-09



# 1001 Uses

## *Endeavour* flight shows versatility

STS-54 was a true demonstration of the versatility of the space shuttle as a launch vehicle, a cargo carrier, a research platform, a classroom and a test bed for future projects.

Photographs taken by the crew show just some of the work that was conducted. Clockwise from top:

1) The crew poses for its in-flight portrait. From left are Mission Specialist Greg Harbaugh, Pilot Don McMonagle, Commander John Casper and Mission Specialists Susan Helms and Mario Runco.

2) Casper floats near the commercial generic bioprocessing apparatus station on *Endeavour's* middeck. A friction car and its accompanying loop—part of the Toys in Space package—can be seen just above his head.

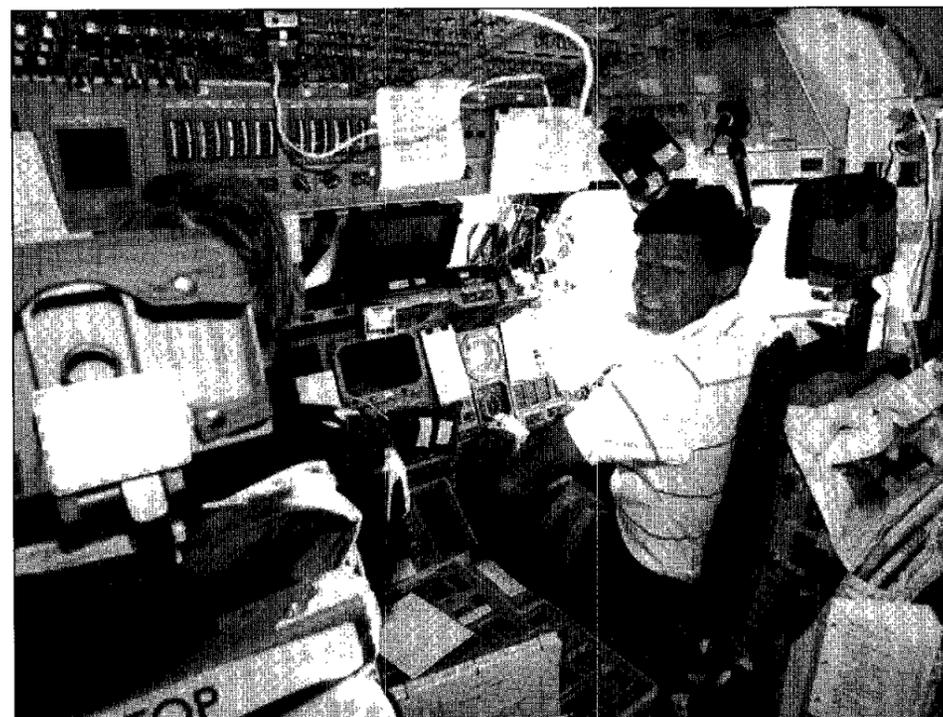
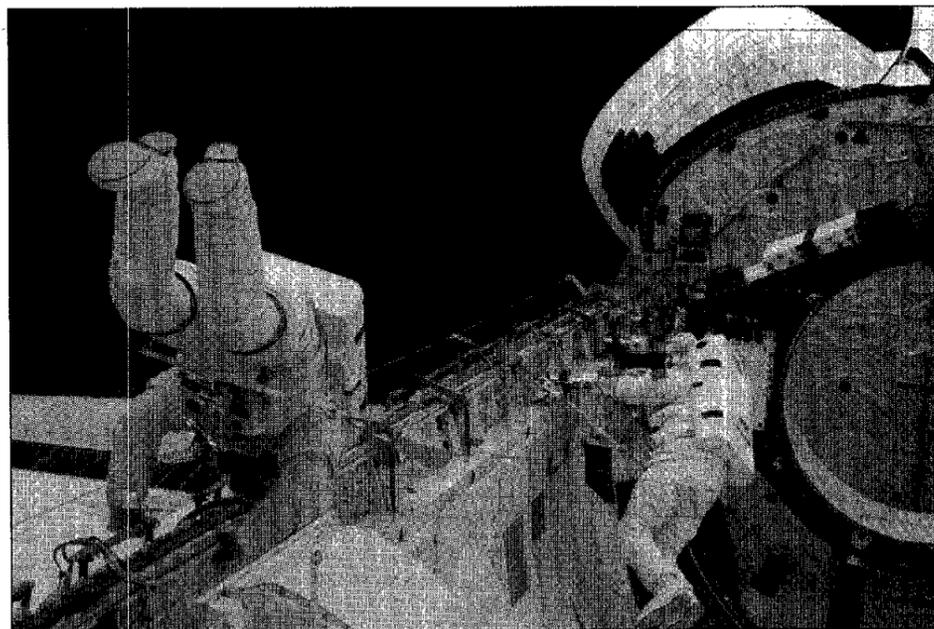
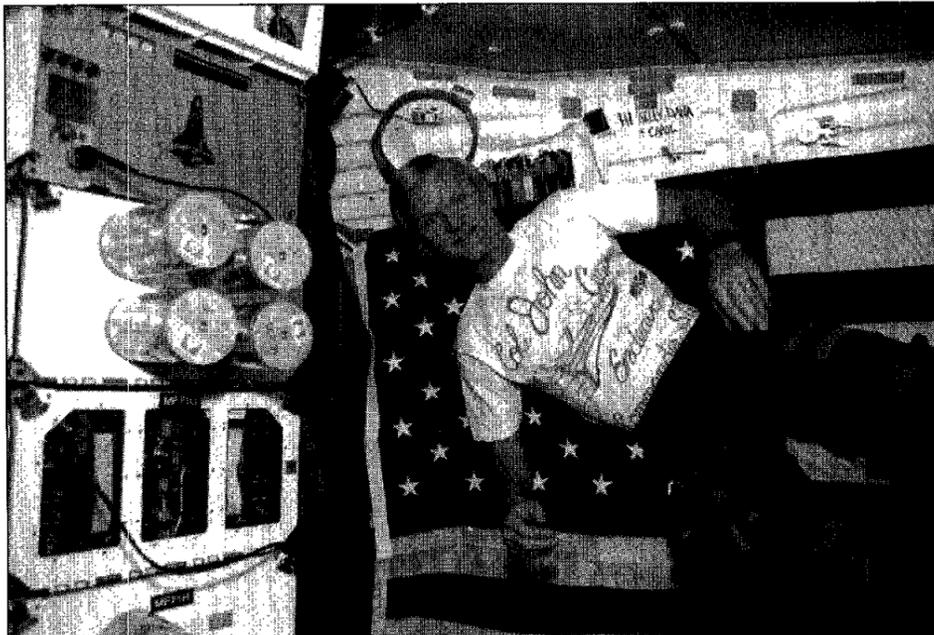
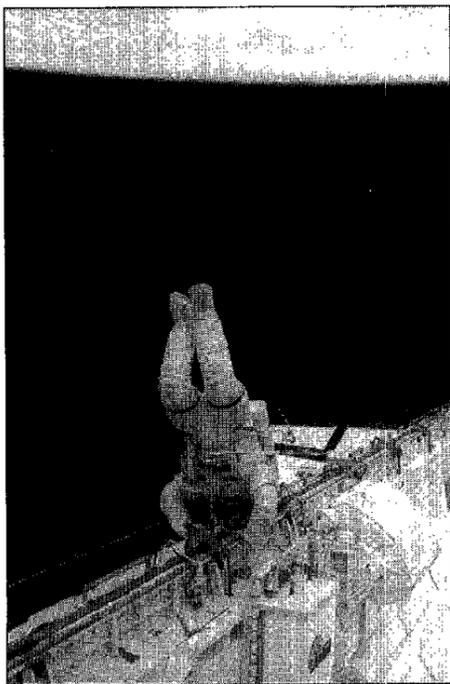
3) Harbaugh, with the red stripe on his space suit leg, carries Runco along the starboard side of *Endeavour's* cargo bay during the 4-hour, 28-minute space walk in an evaluation of how well an astronaut can move about in space with a "bulky object" in hand.

4) Marking a possible space first, Helms plays the keyboard while floating about on *Endeavour's* middeck.

5) McMonagle, at right in the pilot's seat, shares the flight deck with Casper as the pair performs a maneuver.

6) Helms communicates with ground controllers about CGBA as she holds samples from the experiment in her left hand. Sleep restraints can be seen in their temporary stow position behind her.

7) Harbaugh moves along the starboard side of *Endeavour's* payload bay as part of a test of his ability to translate from one place to another using various kinds of handholds. □



# Antarctic ozone hole as big as ever in 1992

Continuing observations by the Nimbus-7 and Meteor-3 Total Ozone Mapping Spectrometer instruments have confirmed that the depletion of stratospheric ozone over Antarctica in 1992 was as severe as any previous year.

In 1992, the "ozone hole" developed one to two weeks earlier than prior years. Scientists at Goddard Space Flight Center also have confirmed that on Sept. 23, 1992, the Antarctic ozone hole was the largest on record.

On that date, the surface area of

the ozone hole reached 8.9 million square miles (24.35 million square kilometers), but fell off to less than 7.7 million square miles (20 million square kilometers) in early October. For comparison, the surface area of the North American continent is 9.4 million square miles.

This past year's Antarctic ozone depletion was comparable to the 1990 ozone depletion in duration and depth, NASA scientists report. The 1992 ozone hole breakup began in early December, later than the normal mid-to-late November

break-up. Late break-ups also occurred in 1987 and 1990.

The hole, or area of ozone depletion, was still present as late as Nov. 30, 1992, when levels were still below 220 Dobson Units and the size was 1.7 million square miles (4.5 million square kilometers).

TOMS measured a record low of 110 Dobson Units on Oct. 6, 1991. The lowest value reached in 1992, 124 Dobson Units, occurred on Sept. 27. However, this value is uncertain because balloon mea-

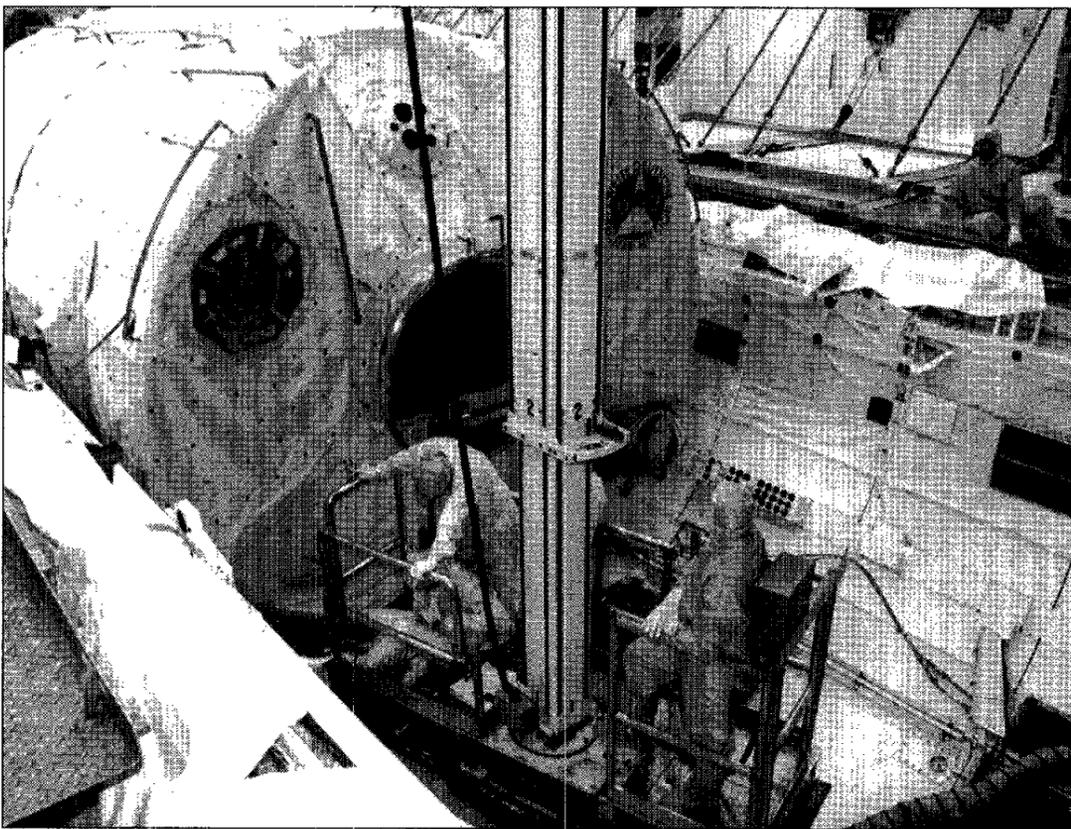
surements found that ozone in the lowest part of the stratosphere was unusually low in 1992. It is possible that the actual value could have been as low as in 1991.

The "ozone hole" is a large area of intense ozone depletion, below 220 Dobson units, over the Antarctic continent that typically occurs between late August and early October and typically breaks up in mid-November. One hundred Dobson Units equals a layer of gas one millimeter thick at the surface. Scientists have shown that man-

made chlorine is the primary cause of ozone hole formation.

The 1992 Antarctic ozone depletion also may have been affected by the continued presence of sulfuric acid droplets in the upper atmosphere created by the June 1991 eruption of Mount Pinatubo in the Philippines.

This data from the TOMS instrument onboard NASA's Nimbus-7 satellite is consistent with that of the TOMS onboard the Russian Meteor-3 satellite launched in August 1991.



NASA Photo

**LONG MODULE**—Kennedy Space Center workers install the Spacelab D-2 module in the payload bay of *Columbia*. The seven-person STS-55 crew will work for almost nine in the long module on a variety of investigations into fluid physics and human physiological changes in microgravity. Additional experiments will continue the investigations of the Earth's atmosphere and topography, as well as galactic astronomy and technology development.

## Crossfield earns Distinguished Public Service Medal

Famed test pilot A. Scott Crossfield has been awarded the NASA Distinguished Public Service Medal for his contributions to aeronautics and aviation over 50 years.

The award was presented by NASA Administrator Daniel Goldin in a Capitol Hill ceremony honoring Crossfield's retirement from federal service Tuesday.

Crossfield played a pivotal role in

NASA's highly successful X-15 research aircraft program in the late 50s and early 60s. He also flew most of the early experimental X-series research planes.

More recently, he has been a key advocate of the National Aero-Space Plane program as technical consultant to the U.S. House of Representatives Committee on Science and Technology.

"Scott's pioneering efforts with the X-series of airplanes and his contributions to the X-15 program were vital to the historic flight research accomplishments by NASA and the NACA," Goldin said. "He has continued to apply his skills and talents to aeronautics with his visionary advice and counsel on the NASP program and the potential it offers to the nation."

## Valentine's dance features 21-piece orchestra

The first JSC Employees Activities Association adult social event of the year will be a Valentine's dinner and dance on Feb. 13.

The 21-piece Brass Rhythm and Reeds Orchestra, formerly known as

Contraband, will play dance music from 9 p.m. to midnight at the Gilruth Center. The event begins with a social hour at 7 p.m. and a roast loin of pork dinner at 8 p.m.

Tables are available to seat eight

or 14 people. Tickets are \$15 per person and are on sale in the Bldg. 11 Exchange Store from 10 a.m.-2 p.m. weekdays until Feb. 10.

For more information, call Mike Gaudiano at x58318.

## Study may advance cancer research

(Continued from Page 1)  
Freeman and David Tsao.

The success of the experiment will answer two questions for the space program, Spaulding said. First, it could answer the question

about mechanisms that suppress human immune systems in space. and second, it will demonstrate that the rotating-wall vessel is an appropriate first step for modeling microgravity effects on human tissue.

"As we move toward building space stations, we will expand our understanding of various scientific fields. This will then drive technological advances on Earth," Spaulding said.

## Brown will speak Feb. 26

(Continued from Page 1)

Williams, 282-3669; and Charles Noel, x33219.

In addition, the traditional NASA-JSC Black History Month Program is set for 1:30 p.m. Feb. 26 in Teague Auditorium. Tony Brown, executive producer of the nationally televised PBS series "Tony

Brown's Journal," the country's longest running, top-ranked African Affairs series.

Brown also will attend a 5 p.m. reception at the Nassau Bay Hilton following the program.

For more information, call the Equal Opportunity Programs Office at x34831.

## New building offers convenience

(Continued from Page 1)

vide information on federal employment and hiring opportunities at other agencies.

The Employment Office will con-

duct secretarial pre-employment interviews in the new building, providing greater flexibility and in scheduling more convenience for applicants.

## Space News Roundup

The **Roundup** is an official publication of the National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Texas, and is published every Friday by the Public Affairs Office for all space center employees.

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

Editor ..... Kelly Humphries  
Associate Editor ..... Kari Fluegel

## Astronauts give Silver Snoopy awards to 18 JSC employees

Astronauts presented Silver Snoopy awards to 18 JSC employees in the closing months of 1992.

The most recent civil service employees to join the ranks of Snoopy owners are Stan Hutchison, Ben Sellari, Lou DeLuca, Linda Perrine, Dave Marquette, Jim Ruskowski and Karen Armstrong from the Mission Operations Directorate; Steve Glenn, Cal Seaman, Karl Zimmer and Howard Wagner of the Engineering Directorate; LeLe Newkirk of the New Initiatives Office; Paul Stull of the Information

Systems Directorate; Martin Coleman, Robert Patterson and Larry Dietlein of the Space and Life Sciences Directorate; and Ralph Anderson and Al Branscomb of the Orbiter and GFE Projects Office.

The Silver Snoopy award, administered through the Manned Flight Awareness Program, is the astronauts' personal award for outstanding contributions toward mission success and flight safety. It is presented to less than 1 percent of the NASA and contractor work force.



## STS-54 crew to brief employees Tuesday

The STS-54 crew will brief employees on their recent mission at 10 a.m. Tuesday in Teague Auditorium.

Commander John Casper, Pilot Don McMonagle, Mission Specialist Mario Runco, Greg Harbaugh and

Susan Helms will share their experiences by narrating photographs, film and videotape of the flight aboard *Endeavour*.

Crew members also will receive their NASA Space Flight Medals at the ceremony.

## ACRV Project Office on its own

(Continued from Page 1)

The Management and Plans Office will manage and control all ACRV contracts and develop overall project plans.

The ACRV Project Office will depend heavily on support from JSC's line and institutional organiza-

tions, and co-located offices staffed by the Engineering Directorate, Safety, Reliability and Quality Assurance Directorate and the Comprollers Office will remain an integral part of the organization. Formal approval of the new office is pending at NASA Headquarters.