

National Aeronautics and Space Administration Lyndon B. Johnson Space Center Houston, Texas



Flight review

Relive the14-day STS-62 mission as seen by its crew members. Photos on Page 3.



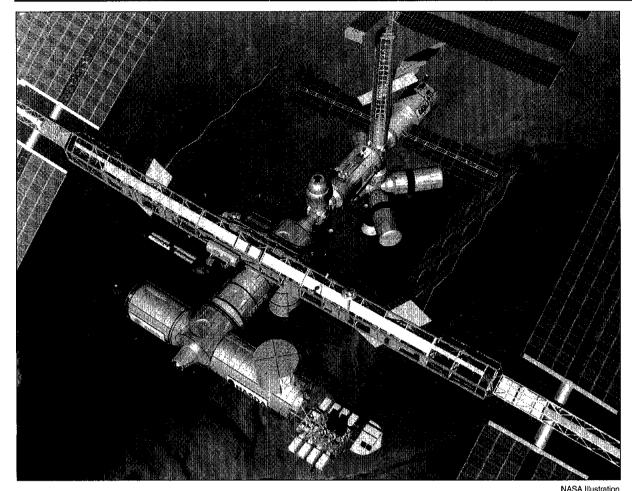
Bird's eye view

JSC employee provides a technological assist to nesting doves in Bldg. 31. Photos on Page 4.

<u>Space News Roundup</u>

Vol. 33

April 1, 1994



This illustration shows Phase III of the planned international space station in its fully operational state including elements from the United States, Europe, Canada, Japan and Russia. The space station system design review involving NASA and its international partners concluded last week at JSC.

Senate approves buyout package

Agency plans to reduce staffing by 825 positions

By Eileen Hawley

The long-awaited Governmentwide buyout bill was passed by the Senate on March 23 paving the way for eligible NASA employees to receive a lump sum payment of up to \$25,000 if they voluntarily leave the agency before July 3, 1994.

President Clinton is expected to sign the bill shortly providing federal agencies with the legal authority to proceed with the buyout. NASA Administrator Daniel Goldin said passage of the bill was "a key development that will benefit the entire NASA family as we reshape the agency to meet new realities."

According to the Associate Administrator for Human Resources and Education, Spence Armstrong, NASA intends to reduce the agency staff by 825 full-time equivalent positions through the buyout program. Those buyouts will be allocated to the field centers that are over ceiling due to realignments or changes in connection with space station redesign. JSC has an initial allocation of 132 buyout packages.

Allotments also were provided to Headquarters, Kennedy Space Center, Lewis Research Center and Marshall Space Flight Center. Remaining centers will receive buyout slots only if the other centers do not use their allocation or if additional funds become available.

"The suspense is over for the many NASA employees and workers throughout the federal government," Armstrong said. "We anticipate that many long-time dedicated NASA employees will take advantage of this opportunity. They will go with the satisfaction of a job well done and the knowledge that their departure helps NASA avoid a very difficult reduction in force."

According to Harv Hartman, director of Human Resources, priority for

buyout will be given first to those employees who voluntarily leave by May 3 and then to those employees who leave between May 4 and July 3. Within those categories, buyouts will be offered in the following priority order: those employees eligible for "early out"; supervisors and managers GM 14 or above; all other GS/GM 13's and above; and all remaining employees. All permanent employees with at least one year of service, with the exception of the Senior Executive Service and astronauts, are eligible to participate in this program.

"I am very pleased the buyout bill was approved," said Center Director Dr. Carolyn Huntoon. "It provides the sort of incentive that private industry has offered for many years, and benefits our employees who were considering retirement."

Employees interested in participat-Please see **BUYOUT**, Page 4

System design review complete

INTERNATIONAL

SPACE STATION

By Kari Fluegel

With the completion of the system design review last week, plans for the international space station are maturing rapidly and the orbiting research facility is on track for assembly to begin in 1997 as scheduled.

"This was a major milestone for the international space station," said Space Station Director Wilbur Trafton. "The space station team has just conducted a comprehensive review of the requirements, configuration and the maturity of the station's technical definition. "

The system design review included participants from NASA, the

Canadian Space Agency, the European Space Agency, the Italian Space Agency, the Japanese Space Agency, the Russian Space Agency, the prime contractor Boeing and Tier I subcontractors Rocketdyne and McDonnell Douglas.

Managers reviewed and evaluated the overall configuration, technical requirements and detailed specifications for the space station during the meeting.

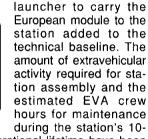
"I'm extremely pleased with the results of this program review," said Program Manager Randy Brinkley. "The results of the SDR demonstrate that the international space station has a high degree of design maturity. This program is right on track to provide the science community with a world class orbiting laboratory."

The SDR resulted in a consensus among program managers on the technical validity of the design and completeness of the station's system specifications, the operations concept and requirements for interfaces with the space shuttle and Russian launch vehicles.

Planned assembly of the station begins with the launch of the Russian "FGB" vehicle in November 1997. A docking compartment will be added before the first American launch in December 1997. The Russian service module will be added to the station in January 1998, followed by the universal docking module and the science power platform. The U.S. laboratory module will be launched on the third U.S. flight in May 1998 and will signal the beginning of human-tended science operations.

The Canadian-built robotic arm will be launched in June 1998 and the addition of the Soyuz transfer vehicle in August 1998 will provide capabilities for extended on-orbit operations. The Japanese experiment module will be launched in early 2000 and the ESA laboratory module added in June 2001. Assembly of the station should be complete in June 2002.

In total, the sequence provides for 13 Russian and 16 U.S. assembly flights, with use of the Arianne V



year operational lifetime have been significantly reduced.

The SDR also confirmed that all station systems have a high degree of design maturity. The guidance, navigation and control system is 97 percent complete, and the communications and tracking system is very mature with analysis and testing indicating all station requirements will be achieved.

Of the 17 open issues remaining, most deal with providing for additional on-orbit payload storage, addressing Japanese experiment module and ESA module ventilation noise levels and determining the location and specifications for an optical quality window in the station design.

With the completion of the SDR, the space station team will refine the design to more detailed levels. In April 1995, the program will conduct the critical design review for the station, a milestone that means the detailed engineering design essentially will be complete.

"We have come a long way in a short amount of time, and that is due to an unbelievable level of professional dedication and hard work by all the program team members," Brinkley said.

SRL-1 uses radar, people to view Earth with new eyes

By Kelly Humphries

The STS-59 Space Radar Laboratory-1 mission will be a tightly choreographed imaging flurry that

uses new eyes and meshes people and machines in an attempt to understand our home world and its ecosystem.

"There's not anything that hits closer to home than something that touches every one of us," Payload Commander Linda Godwin said Tuesday. "We think this is a great dedicated Earth sci-

ence mission to help us start to understand and at least produce more quantitative measurements of what is going on."

Commander Sid Gutierrez, Pilot Kevin Chilton and Mission Specialists Jay Apt, Rich Clifford and Tom Jones will join Godwin in working 24 hours a day on two shifts to support the Space Radar Laboratory-1 instruments in the payload bay

with more maneuvers and

more Earth observations

photography than has ever

been attempted on a

To help point the syn-

thetic aperture radars, the

crew will divide evenly

about 450 shuttle maneu-

vers taking 14,000 photo-

graphic images that will

space shuttle flight.





help scientists on the ground interpret the radar data. Fourteen different cameras and special films will be used for the photography, plus television cameras in the payload bay will be aligned to give a Please see **HOME**, Page 4



JSC Photo by Jack Jacob

STS-59 astronauts, from left, Kevin Chilton, Sid Gutierrez, Tom Jones, Linda Godwin, Jay Apt and Rich Clifford, check out some of the equipment they will be using on their upcoming mission during final bench review.

Technicians closing Endeavour's hood for Thursday launch

By James Hartsfield

Technicians began shutting the hood on *Endeavour's* engine room and packing the crew's equipment in the cabin this week as preparations for a launch at 7:07 a.m. CDT Thursday of STS-59 entered the stretch.

Commander Sid Gutierrez, Pilot Kevin Chilton, Payload Commander Linda Godwin and Mission Specialists Jay Apt, Rich Clifford and Thomas Jones plan to depart JSC for Florida early Monday morning to prepare for the launch. The countdown clock is scheduled to start ticking at 10 a.m. Monday.

Endeavour's primary cargo is the Space Radar Laboratory-1, a radar that will study the Earth's oceans, geology, environment, topography and atmosphere. For STS-59, the crew will be at work around the clock in two 12-hour shifts, and an Please see SRL-1, Page 4

Space News Roundup

JSC **Ficket Window**

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

NASA Night at Astroworld: Visit Astroworld from 6 p.m.-midnight, April 8. Cost is \$11.95 for first 5,000 tickets sold, then price increases to \$12.95. Receive a free Waterworld ticket upon entrance.

Rockets tickets: Tickets available for Rockets vs. Denver Nuggets, 2:30 April 24. Cost is \$11; reservations until April 1. Tickets for probable Rockets playoff game on April 28 or 29. Cost is \$23.50; Reservations until April 5.

Astroworld Early Bird: Tickets available for one-day admission for 1994 season. Cost is \$16.75 per person. Tickets must be purchased by May 31.

Seaworld of Texas: Discount tickets: adult \$20.95; child (3-11), \$14.25.

- Fiesta Texas: Discount tickets: adult \$18.95; child (4-11) and seniors (55+), \$14.25.
- Moody Gardens: Discount tickets for two of three different attractions: \$9,50
- Entertainment '94 Coupon Books: Bay Area/Galveston/Downtown or FM 1960/Downtown: \$30 each, \$1 off first book for civil servants. Gold C Books: \$8
- Space Center Houston: Discount tickets: adult, \$7.95; child (3-11), \$4.75; commemorative, \$9.95. Metro tickets: Passes, books and single tickets available.

Movie discounts: General Cinema, \$4.75; AMC Theater, \$4; Loew's Theater, \$4.50 Book available: Suddenly Tomorrow Came: A History of the Johnson Space Center. Cost, \$11 Stamps: Book of 20, \$5.80

Upcoming Events: NASA Picnic, May 7.

Page 2

Gilruth Center News

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

Intercenter Run --- The Spring Intercenter Run begins April 1 and continues to April 30. Run or walk a two-mile or 10K course and submit times to the center.

Basketball league --- Registration for Spring basketball league is April 14. Volleyball league --- Volleyball Mixed C Spring League registration is April 12 and Mixed B registration is April 13.

Weight safety - Required course for employees wishing to use the weight room is offered from

Seison p.m. April 6. Pre-registration is required. Cost is \$5.
Defensive driving — Course is offered from 8:15 a.m.-3 p.m. Saturday. Next class is April 9. Cost is \$19

Scuba class - New class begins April 7. For additional information, contact Bernie Ehlers, 333-5364

Sailing club — A start-up meeting is planned for 5:15 April 8 & 15 at the Gilruth Center. Sailing lessons are planned for May and June. For information, contact Richard Hoover, x31360. Golf lessons --- Class begin April 12 for all skill levels. Cost is \$90 for six weeks. For additional

information, call x33345. Aerobics ---- High/low-impact class meets from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is

\$32 for eight weeks. Exercise - Low-impact class meets from 5:15-6:15 p.m. Mondays and Wednesdays. Cost is \$24 for eight weeks.

Aikido - Martial arts class meets from 5-7:30 p.m. Tuesdays and 6:15-8:15 p.m. Wednesdays Black Belt class from 6-8 p.m. Fridays, requires instructor permission. Cost is \$25 per month. Stamp club — JSC Stamp Club will meet from 7-9 p.m. every other Monday. For more informa-

tion, call Dianne Kerkhove at 554-2764

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

Dates & Data

Today

JSC

Cafeteria menu — Special: baked chicken. Total Health: roast beef au ius. Entrees: deviled crab. Creole baked cod, baked chicken, beef cannelloni, Reuben sandwich, Soup: seafood gumbo. Vegetables: seasoned carrots, peas, breaded okra, steamed cauliflower.

Monday

Cafetería menu - Special: hamburger steak. Total Health: vegetable lasagna. Entrees: beef Burgundy over noodles, barbecue smoked link, vegetable lasagna, steamed fish, French dip sandwich. Soup: cream of chicken. Vegetables: buttered corn, steamed spinach, vegetable sticks, navy beans.

Tuesday

Cafetería menu — Special: turkey and dressing. Total Health: roast turkey. Entrees: baked meatloaf, barbecue spare ribs, liver and onions, baked chicken, French dip sandwich. Soup: black bean and rice. Vegetables: steamed broccoli, California vegetables, breaded squash, savory dressing.

Wednesday

Toastmasters meets - The Spaceland Toastmasters Club meets at 7 a.m. April 6 at the House of Prayer Lutheran Church. For additional information, contact Dale Denais, x30432; or Steve Shields, x31941.

Astronomy seminar --- The JSC Astronomy Seminar will meet at noon April 6 in Bldg. 31, Rm. 129. For more information, call AI Jackson, 333-7679.

Cafeteria menu - Special:

<u>wap Shop</u>

Mexican dinner. Total Health: ground turkey tacos. Entrees: Parmesan steak, beef cannelloni, catfish and hush puppies, steamed fish, Reuben sandwich. Soup: seafood gumbo. Vegetables: peas and carrots, ranch beans, mustard greens, Spanish rice.

Thursday

Blood drive - St. Lukes Hospital will sponsor a blood drive from 8:30-11:30 a.m. and 1-2 p.m. at the ISC bldg., 16511 Space Center Blvd. For additional information, contact Jean Blakeway, 280-3859.

Russian speakers — Practice Russian language skills from 11 a.m.-1 p.m. April 7 in the Bldg. 3 cafeteria. For more information, call Jack Bacon, x38725, or Amy Mendez, x38066.

Cafeteria menu - Special: smothered steak. Total Health: steamed pollock. Entrees: chicken and dumplings, corned beef and cabbage, broccoli cheese quiche, steamed fish, French dip sandwich. Soup: navy bean soup. Vegetables: steamed cabbage, cauliflower au gratin, buttered carrots, lima beans.

Friday

Cafeteria menu — Special: baked meatloaf. Total Health: lite macaroni and cheese. Entrees: baked scrod with Hollandaise, broiled chicken, pork and beef egg rolls, steamed fish, Reuben sandwich. Soup: seafood gumbo. Vegetables: stewed tomatoes, seasoned spinach, cut corn, macaroni and cheese.

April 13

Wanted

x37557.

shop. x38278 or 334-7258.

x30686 or 480-3260.

Toastmasters meets - The Spaceland Toastmasters Club meets at 7 a.m. April 13 at the House of Prayer Lutheran Church. For additional information, contact Dale Denais, x30432; or Steve Shields, x31941.

Astronomy seminar --- The JSC Astronomy Seminar will meet at noon April 13 in Bldg. 31, Rm. 129. The video tape "Galileo, Earth and Moon Encounters" will be shown. For more information, call AI Jackson, 333-7679.

PSI meets - The Clear Lake/ NASA Area chapter of Professional Secretaries International meets at 5:30 p.m. April 13 at the Holiday Inn on NASA Road 1. For additional information, contact Elaine Kemp, x30556 or Diana Peterson, x30390.

April 14

IEEE meets — The Galveston Bay Section of the Institute of **Electrical and Electronic Engineers** will meet at 11:30 a.m. April 14 in the Gilruth Center. Dr. Kamlesh Lula will discuss "Imaging the Home Planet from Space Shuttle Missions." For additional information and reservations, contact Barbara Nepreaux, x30194.

Russian speakers — Practice Russian language skills from 11 a.m.-1 p.m. April 14 in the Bldg. 3 cafeteria. For more information call Jack Bacon, x38725, or Amy Mendez, x38066.

April 20

Toastmasters meets — The Spaceland Toastmasters Club meets at 7 a.m. April 20 at the House of Prayer Lutheran Church. For additional information, contact Dale Denais, x30432; or Steve Shields, x31941.

furn desk, hutch & chr, \$400. 554-6242.

x36045 or 486-6989.

Anthony, 921-7212.

new \$600, sell \$100. 484-0898.

115-70-14. James, 283-1551.

or 326-4973.

7049.

Wedding dress, white, sz 5P, victorian col-lar, bishop sleeves, lace bodice & skirt,

chapel train/veil, new \$800, sell \$375. Cindy,

\$35; heavy duty 7" Snap-on tool grinder, ball bearing VG cond, \$70; 15" squirrel cage blower fan, 3 spd, 110 VAC, ex cond, \$35/ea;

worth brass gate valve, ex cond, \$25; 5 sets aluminum sliding door tracks, 0.25" thick

wood or glass drs, ea 6' long, \$18/set.

HPM-100 speakrs, \$100/pr; Marantz 2265

stereo receiver, \$50. Steve, x37152. or 992-

Salon style sun lamp, full length, has timer,

BayArea coupon book, unused, \$29;

Armoire, 7'x5'x5' unfin, \$75; MarilyIn Monroe

poster, orig stamped by artist, unframed, \$1k OBO. x30003 or 992-7120.

VHS VCR, \$50; pedal fan, 3 spd, \$35; multi-use table, 30" x 60", \$25. 992-1466.

AT&T answering mach, \$20; Panasonic

Ceiling fan; spare tires, sz, 195-75-14 &

Shingles, 52 bundles of GAF, weathered

wood, 25 yr warr, \$450 OBO. Ellen, x34111

President & First Lady Charter Gold mem-

Brief case, expand, brown, \$15; Pioneeer

SS ball valve w/teflon set, \$25; 1" Wal-

Auto-transformer 0-140 VAC 7.5 amps, \$50; 0-130 VAC 2.25 amps, \$10; hvy duty 5" Wilton swivel vise, \$70;1 HP AC motors & sm; ICOM-1C-HM9, speaker/microphone,

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

JSC

Rent: Lake Travis cabin, cent A/H, accom 8, fall & winter, \$325/wkly \$90/dly. 474-4922. Rent: Condo, Wolf Creek, Co, sleeps 6, no

smoking or pets. Bob, x30825 or 998-7372. Rent: Arkansas cottage, Blue Mt Lake furn, 4 ac, \$250/wkly \$50/dly. x33005 or 334-

7531. Rent: Galveston beach house, dly/wkly CA/H, furn. Ed Shumilak, x37686 or 326-4795.

Sale: Galveston beach house, 3-2, CA/CH, furn. Ed, x37686 or 326-4795.

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

Sale: Nassau Bay, house, 4-2-2, \$113,950. 333-3876.

Sale: Sagemont, 3-2-2, both formals. approx 1800 sq ft, \$72k. Ben, x34339 or 481-1439

Lease: Webster, Ig condo, 2-1, FPL, appl, upstairs, W/D conn, \$495/mo. x31275 or 486-0315 Rent: Galveston beach house, wkly/wknd.

cond, A/C, AM/FM/cass, \$5.8k. 334-4240. '89 Celica ST, 5 spd, A/C, PS, AM/FM/ cass, sunroof, 72k mi, wht/dk blue, ex cond,

\$6k. Julie, x38866 or 332-9270. '87 Pontiac 6000 STE, 53k mi, auto, V6, loaded, \$5495 OB. Steve, 783-5386. '92 Toyota Paseo, 5 spd, moonroof, cass, 58k mi, \$9k OBO. Suresh, x49659 or 488-

'80 Corvette L82, wht/red inter, ex cond, auto, \$9.5k, 487-9378.

'86 Honda Accord DX, 4 dr, 5 spd, 142k mi, \$3.5k. Jeff, 333-7062.

Boats & Planes

224 Chaparral, cuddy cabin w/head, 200 hp Johnson, radio, depth-finder, out riggers, ex cond, \$12k. Jim, 286-9632.

Shrimp boat, 10 x 25, nets, drs, radio & trailer. Mary, 991-7247. '70 Glaston 16' bass boat, '79 70 hp

Evenrude, pwr TLT, trolling motor, depth find-er, \$1750. Larry, x49103 or 922-1696.

VIP Vision, 18', 130 hp OMC/I/O, ex cond, \$9.75k OBO. Jennifer, x38668 or 286-0507. Capri 14.2 sailboat, main, jib, seats 4,

w/trailer, \$1.5k. Craig, x36206 or 280-0176. Chrysler 22' Sailboat, sleeps 6, w/galley/ head, fixed keel, 5 hp outboard, mainsail & 2 jibs, ex cond, \$2.8k. 282-1727.

25' Jefferson Lafitte shrimp boat, 4/nets. 2/dry boxes, 1/wet box, 2/100 lb Igloos, VHF radio, CB, w/trailer. Becky, or Mary L., 991-7247

'87 Marlin Empress, 22', 260 hp merc, Cutty cabin w/cabinets, dual batt, twin fuel tanks, \$10k. Phil, 212-1339 or 337-6614.

mm/1.8, \$20. Gregg. x31250.

Musical Instruments

Upright accoustic Bass, solid cond, \$500. 286-2713 Ovation 12 string guitar w/hardshell ovation

case. Jay, 473-1678 Dual reflex box for bass w/pair of 10"

Pyramid Super Pros, \$240. Rudy, x36563 or 534-6187.

Pets & Livestock

EMU chicks & breeders, \$2.5k ea. 482-0874.

Free yellow Lab, 11 mo, housebroken, good w/children. Eric, x39491. Tortoise shell cat, female, spayed. 326-2905

Lost & Found

Found: bike, describe to claim, Paul, x33744.

Lost: multi-colored umbrella, March 14, bldg 30, first floor mailroom, recovery important. Bill, x31985.

Household

Waterbed, kg sz w/8 drawers, 3 cabinet pedestal, full dresser w/mirror, chest of drawers, nightstand, lamps, were \$2k, now \$800 OBO; Sylvania 40" projection TV, \$1.1k; Brother WP-3400 word processor, \$175; contemp lounger, \$40; Hoyt Compound bow, \$125 OBO. Mike, x30993 or 333-1856.

Rattan glass shelf book case, \$150; 2 rattan swivel chairs, foot stool, glass coffee table, \$150. x39335 or 426-2963.

solid wood dresser & mirrored vanity, \$100; TV stand w/storage space, \$15 OBO/all. Nancy, x38887 or Jeff, x39132. Two-piece lighted china cabinet, ex cond,

\$700 OBO. 554-7669. Panasonic 31" TV, PIP, A/V inputs, \$1k OBO. Thanh, x31464.

Mikasa Imperial Lapiz china, 5 pc place settings, \$65/ea; oval platter, \$110. 480-2584

Couch & two coord recliner chairs, ex cond, \$325; Sears microwave & microwave table, \$150/both. 282-6909.

Amana full sz microwave, \$75; bunkbed/ frame, \$75; full sz white bed frame/hdbd/ftbd, \$100. 286-8060.

White washed Oak contemp table, 5 chairs w/mauve cushions, \$450. 482-1505.

Want riders for van pool, West Loop park

Want sm sturdy wood dresser for use in

Want Wake Shield Facility, BREMSAT &

ODERACS payload patches from STS-60 &

Want Ig capacity washing machine, rea-

Want backpacking equip, backpack, tent,

Want working PC 8088, 286, 386, XT,

stove, sleeping bag, water filter. Charlie,

sonably price; road capable trailer to carry 17' cance. Steve, x37152 or 992-7049.

USMP-2 & OAST-2 patches from STS-62,

will buy or trade. Andrew. 280-0647.

and ride to NASA/contractors. Richard,

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Sale: Oakbrook West, 4-2-2, updated, Ig yard, \$99.5k, Denise, x31846 or 486-5146.

Sale: Bay Forest patio home, 3-2-2, upgrades, \$150k. x33075.

Sale: Bay Front Towers, Nassau Bay, 1-1.5-1, lux condo, \$75.5k. x30615 or 335-1910.

Lease: Bay Front Towers, Nassau Bay condo, 2-2-2, \$1.1k/mo. 496-0700.

Sale: Sterling Knoll, 3-2-2, approx 1300 so ft, FPL, swimming pool, \$69.9k. 486-9760.

Sale: Meadowbend, 4-2-2, FPL, \$67,775. 734-5828.

Lease/Sale: Egret Bay condo, 2-2, W/D, \$610/mo + dep/\$45k. 643-3406.

Sale: Heritage Park, 3-2-2, updated, cov deck, storage shed, \$72k. x40213 or 332-7092

Sale: BayWind One condo, 1-1-1, ceiling fans, appl, \$25k. Bill, 332-3649.

Cars & Trucks

'78 Porsche 928, brown, auto, ex cond, 75k mi, \$8.5k. Bill, 244-8889.

'86 Nissan 300 ZX turbo, auto, black, Ttops, AM/FM/cass, A/C, ex cond. Richie, 996-

'74 Triumph Spitfire, w/remov hard top. spare eng, \$1.9k. Craig, x36206 or 280-0176

'84 Toyota Supra, 91k mi, \$3.4k OBO. Mike, x30993 or 333-1856

'79 Buick Park Avenue, 65k mi, \$1.2k. 333-6930.

Camaro, A/C, auto, 2.8L V6, '82 AM/FM/cass, brown/beige, ex cond, \$2.5k OBO, 991-5280.

'89 Honda Civic DX, 3 dr, 5 spd, dk red, ex

'92 Baymaster 18'6", 115 hp Johnson, Motorguide salt water trolling motor, fish finder/depth sounder, \$10.5k. Steve, x47698 or 482-3696.

Grumman alum canoe, 17', 2 life vests, 2 paddles, anchor, ex cond, \$300, 486-9760.

Cvcles

'86 Yamaha YZ 125 dirt bike, ex cond, \$1k. Brad. 326-6228

Audiovisual & Computers

US Robotics Courier HST dual std cellular fax modem, V.32 Terbo at 19,200 BPS, V.17 group III fax at 14,400 BPS, new \$1295/sell \$550. Tony, x47401 or 482-4156.

IBM compatible, NEC-286 computer, 640k RAM, 44MB HD, 2 FD, color moni, kybd, software, \$400. Earl Rubenstein, 480-1998.

Lotus 1-2-3 rel. 4.0.1 for Windows & Lotus Write rel.2.0, \$150/both. 486-5500.

Denon integrated stereo amp, model PMA-520, 70 watts per channel, 5 inputs, \$175. John. x38871.

Osborne PC, CPM OS, 2 FD, w/software, \$150 OBO 992-1466

Compaq portable computer, Epson FX85 rinter, computer table, \$350. Georgia, x34122 or 332-3077

Technics stereo equip tuner, \$40; EQ, \$40; CD player, \$90; EPI Magnus spkrs, \$40/pr. David. x47399 or 660-9654.

Nintendo, 4 controllers, pistol, Olympic games mat. \$70 OBO, x34204 or 480-2954 Blue Dot Matrix printer, \$90, 482-1505.

Photographic

Pentax K-mount lens, 30 mm/5.6, \$70; 50

Art deco, 4 poster bed w/box springs/mattress, dresser, chest of drawers, \$350; playpen, changing table, swing, hi-chair x39335 or 426-2964.

Antique empire dresser w/mirror, restored, \$450; Singer treadle sewing machine, \$150. x31165 or 532-3013.

Kenmore automatic washer & electric dryer, gold, \$40/ea. Jim, x39229 or 482-7873. Waterford crystal, "Lismore" 12 ea, white wine, sauce, champagne & tumbler, \$1k/all. Pam. 538-3291.

Dinette set, 5 pc, 6' oval table w/leaf, \$75. Don. x30634 or 480-1737.

TMK 13" color TV, 13-channel remote, \$35 OBO. David, x40210.

Flip seat/full sz sleeper, blue/white stripe color, \$100 OBO. x55805 or 992-4903. Gas range, \$200; microwave, \$100. 482-

5210

Rattan & smoked glass breakfast table w/4 chairs, \$65; solid wood coffee table, \$30. Ron, x48712 or 480-6201.

Living room set & dinette set w/4 chairs. \$250 OBO/all, will sell sep. Vicki, x37853 or 335-0890.

Rattan coffee table, 7 end table w/smoked beveled glass insets, \$75/ea. Karen, 282-4141

Panasonic microwave oven, 11 cu ft, 800 watts, touch pad ctris, ex cond, \$85; 5-drawer wood sewing table, 48"x30"x22", \$40; '70's style stoneware dishes, full-set, service for 8, \$25. David, x47399 or 6609654.

Dining room table & 8 chairs, maple w/ dusty rose seat cushions, \$450 OBO. Carol,

Antique mirrored armoire, \$120; matching

CPU's, monitor, HD, control cards, kybds, mouse, & prntr, equip for Dyslexic reading teacher. Bill, x39210.

Want female roommate, 3 BR house, Landing LC, \$300/mo + 1/2 util. Cathy. x41267 or 554-4579.

Want non-smoking roomate, 2-2-2, Piper's Meadow, no pets. \$300/mo + 1/2 util. Tracv. x47120 or 486-3946.

Want responsible person to rent furn room. Friendswood, \$250/mo, util pd. 992-0307.

Want working Nordic Track exercise machine. Carol, x37055.

Miscellaneous

King sz waterbed: go-cart, Mary, 991-7247. Liquidating, 50 plate "Collectables" various artists, \$15 ea or 2 for \$25. Earl Rubenstein, 480-1998

Fiberglass camper top for long/wide bed Ford truck, ex cond, \$395. Jim 286-9632.

French provincial desk/dresser: 6 drawer dresser/mirror; 6 AMP batt charger; floor polisher; 13" B/W TV; TI 99-4A; computer desk; stuffed animals; prom dress. Fred, 944-3523. Up to 4 American Airlines group tickets, roundtrip, "Open Jaw" Dallas to London 5-29-94, Paris to Dallas, 6-11-94, \$675 per ticket. 486-5500.

Saddle, 17" seat, \$50. 532-4237.

Amana microwave 700 watts, \$65: Hoover Elite 350 upright vaccum , \$35; Weber portable BBQ grill, \$10; Serengeti sunglasses, \$60: box fan, \$50: Harman/Kardon TU610 tuner, \$25; cassette holder, \$25; Mr. Coffee 10-cup decanter & warmer plate, \$10. 992-0257.

Surfboards, Stewart 8'10", \$100; T.B.I. 9'8", \$180; O'Neil wetsuit, XXL, \$100; cargo bership, \$500 OBO, yearly renewal at \$6.43/mo. Georgia. x34122 or 332-3077.

Play pen, hi-chair, duet stroller, swing-omatic, infant car seats, bassinett, Broughman stroller, child bicycle carrier, bedroom monitor, bumper pads, all ex cond. 486-5239.

State 10 gal, 110 volt, electric water heater, ex cond, \$50. Bob, 335-5934.

Golf clubs, sq two irons 1-LW, \$175; Tour model 3 irons 2-LW, \$150; Ping Zing clones 3-PW, \$150; Big Bertha woods, \$70. Ken, 283-9233 or 473-2602.

Compound bow, 55-70 lbs. laminated limbs ex cond, \$115. 286-2713.

Diamond ring, 1.5 carat, 14kt gold, mounted w/4 prong Tiffany head & 5 stones on ea side, center dia is 4.6mm, H-I color, S-I clarity, \$1.2k. Karen, 282-4141.

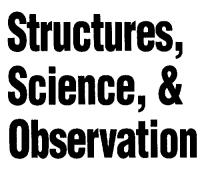
Two President & First Lady Charter Gold memships, \$500. Sandy, x49875 or 489-4843.

Scuba regulator Calipso IV, \$75; 89/90 Voyager service manual, \$20; Goodyear P185-70-R14 SBR, \$20; '30's student school desk. \$75: waterbed heaterr w/controler. \$20: 14" GM sm wheel spare, \$10; 2/15" Ford truck wide tire rims, \$20; roll-up slatted sunshade 6'x6' \$5 Bob x30204 or 333-3885

Monkey grass, 1 gal containers. \$2.50/ea or 5 for \$10; glass jalousie windows, 7-36"x60", 3-29.5"x60", 1-25.5"x60", new \$150 ea, sell \$60/ea, or all for \$550. x30974 or 554-7083

Jacuzzi, rust colored, 6 person cap, \$350; Homelite gas pwr weedeater, ex cond, \$50; Gaffers & Sattler dishwasher, needs work, \$50; Sunbeam, 12 speed table top mixer w/bowls, attach, ex cond, \$100. Gloria, x31891 or 538-2283.





he crew of STS-62 spent 13 days in orbit monitoring the Earth's environment, and studying the applications of materials processing and biotechnology in a microgravity environment.

The five member crew was led by Commander John Casper. His crew mates, Pilot Andy Allen and Mission Specialists Pierre Thuot, Sam Gemar and Marsha Ivins,



ended their mission just 57 minutes short of establishing a new endurance record for shuttle flights. The crew of *Columbia* briefed employees on the mission

Thursday. Crew members also will be appearing at Space Center Houston at 11 a.m. April 7 to share their flight memories. JSC employees will be admitted to the briefing free of charge by showing their NASA badge at the entry turnstile.

Clockwise from top left, 1) On *Columbia*'s flight deck, Ivins prepares to aim three Hasselblad cameras through the overhead windows of the orbiter. Ivins used the three cameras simultaneously to record the same images on three different types of film for comparison and experimentation.

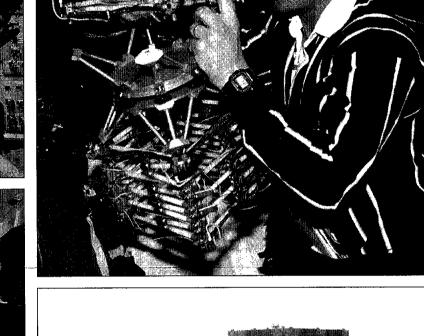
2) From *Columbia*'s middeck, Gemar talks with ground controllers while assisting Allen, in background, during a "soak" in the Lower Body Negative Pressure apparatus.

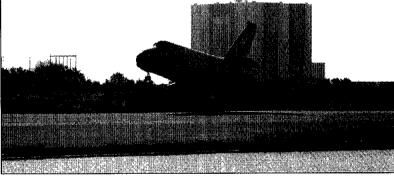
3) Thuot works with the Middeck O-Gravity Experiment. MODE is a reusable test facility designed to study the nonlinear, gravitydependent behavior of two types of space hardware. In this photo, Thuot is working with a model of a large space structure with applications for future spacecraft. MODE also was designed to study the behavior of contained fluids.

4) Columbia passes in front of the Vehicle Assembly Bldg. at Kennedy Space Center moment before its touchdown on March 18. 5) This night view of Indiana, Kentucky and Ohio is just one example of the observation photos taken on board Columbia. The bright lights in the photo are major cities in the three states, with Springfield, Dayton and Cincinnati in the center with Lake Frie. Clev land and Akron in the upper left quadrant. The border-forming Ohio River delineates Louisville and New Albany in the lower right corner with Lexinaton visible just below center at the right edge of the photo. Indianapolis can be seen in the lower left corner. 6) Crew members take a moment to pose for the on-orbit crew photo. From left front are Casper and Thuot, and in the back row from left, Allen, lvins and Gemar. 7) Casper and Gemar prepare to film additional Earth observations during their 13-day flight. Casper holds a large format, Linhof camera, while Gemar finishes adding a roll of film to a 70mm Hasselblad camera. Documentation and Earth observations occupied much of the on-duty time for all five crew members.











NASA Photos

Ida's moon providing new clues to asteroid origins, evolution

The discovery of a natural satellite orbiting asteroid Ida is providing scientists an intriguing new clue in deciphering the origins and evolution of these ancient bodies, most of which orbit the Sun in the main asteroid belt between Mars and Jupiter.

The first-ever photograph of an asteroid's moon was taken by the Galileo spacecraft as it flew past Ida on Aug. 28. The image was not transmitted to Earth until recently because the probe is sending back data at a very slow rate.

Amateur astronomers for many years have observed the light of stars blinking off and on as objects such as asteroids pass in front of them in events called stellar occultations. Some have reported "blinkouts" that suggest some asteroids have moons, but such reports have never been confirmed by definite second sightings. The Galileo dis-

SRL-1 readied for Earth studies

(Continued from Page 1)

on-time launch Thursday would have landing planned at 12:14 p.m. central April 16. However, the planned nine-day flight may be extended by a day if supplies prove plentiful aboard Endeavour and science operations find the extra time beneficial.

Work at the pad this week included installation of space suits that would be used in the event an unplanned spacewalk is required; flushes of Endeavour's primary steering thrusters; and closeouts of the shuttle's avionics bays. Today, the SRL-1 batteries are being charged and the launch pad tanks are being filled with the liquid oxygen that will be loaded aboard Endeavour the night before launch.

Meanwhile, *Columbia* is going through post-flight servicing in the Bay 2 shuttle hangar. Work this week on the maiden shuttle, which has its next flight scheduled for July, included the removal of the mechanical arm, testing of the forward reaction control system steering jets, and the draining of excess propellants.

Elsewhere, Discovery is in the Bay 3 hangar in the midst of a standard set of inspections performed on each orbiter after about each five flights. Tests of the main propulsion system plumbing are under way, a new cockpit window is being installed and electrical tests of the drag chute deploy system are being performed.

covery is the first unambiguous evidence of an asteroid moon.

"It previously was thought that natural satellites of asteroids could form, but they probably weren't common," said Torrence Johnson, Galileo Project Scientist at NASA's Jet Propulsion Laboratory. "Having found one fairly quickly, we can say that they're probably more common than previously thought." However, much information including where the moon came from, or details of its orbit are still unclear.

As yet, project scientists do not know the parameters of the moon's orbit, critical information that can reveal the mass of the asteroid. From the photo and spectrometer data, scientists estimate the moon is about 1 mile across, about 60 miles from Ida's center. The position will be more accurately determined as new data are analyzed. The asteroid itself is about 35 x 15

x 13 miles in size.

Galileo's near-infrared mapping spectrometer which scans space objects at a variety of wavelengths to reveal their chemical composi-tions, suggests that Ida's moon is made from essentially the same kind of material as the asteroid. Ida is classified as an S-type asteroid, composed mostly of silicate rocks.

Scientists believe it is virtually impossible that the moon is merely a "captured object" that wandered near the asteroid and was caught by its gravitational field. According to the laws of celestial mechanics, such an event would deflect the smaller object, but not capture it, unless a third force of some kind slowed it down.

"Once we have determined the object's orbit, we can estimate time scales and make better guesses as to where it came from," said Johnson.

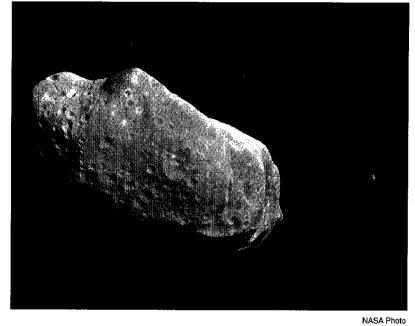




HELPING HAND-A pair of mourning doves received a helping hand from JSC employee Ron Bernhard after the nest they were building in a tree in the Bldg. 31 lobby atrium was dislodged by high winds.

Above, Bernhard points at the reinforced nest he built for the doves with stainless steel netting. At left, one of the nesting pair of doves nestles over its eggs in its newly-secured home.

JSC Photos by Jack Jacob



This photograph transmitted from the Galileo spacecraft shows the first conclusive evidence that natural satellites of asteroids exist. A small moon, about 1 mile across, can be seen orbiting around Asteroid Ida. Ida is about 35 miles long. Galileo took the photograph from a distance of 6,755 miles away during an August pass of the satellite. The moon appears to be about 60 miles away from the center of the asteroid.

Space Center Houston plans cadet concert, summer job openings

Space Center Houston will present the United States Air Force Academy Cadet Chorale on April 9.

The Chorale will serenade guests at the visitors center at a concert beginning at 1:30 p.m. under the lunar lander on the main plaza. Musical selections will include patriotic, secular and sacred themes, as well as

a "Salute to Broadway."

The Cadet Chorale is appearing as part of Space Center Houston's "Celebration 25 -Man on the Moon"

activities celebrating the 25th anniversary of the lunar landing and the Apollo program.

"The Cadet Chorale will definitely bring added excitement to the events surrounding 'Celebration 25'," said Vance Ablott, general manager of Space Center Houston. The group consists of men and women from all four cadet classes who have represented the Academy through

Safety center to conduct refresher training course

JSC employees whose job duties may expose them to potentially hazardous materials must participate in a refresher hazardous communications training course.

"Even employees who have received previous training need to attend this refresher course," said Karen Bleam, HazCom course instructor. "A number of revisions have been made to HazCom program and we need to make sure our employees are informed about

music and song throughout the United States.

Celebration 25 activities will continue through the Labor Day weekend at Space Center Houston. Ongoing events include a lunarthemed laser show, the LEGO 'Travel in Space World Show', the

NASA Preview Center, and a video retrospective of the lunar anding entitled 'A Leap of Faith.'

Meanwhile, Space Center Houston is interviewing for summer positions and part-

time operations positions. Space Center Houston is accepting walk-in interviews from 9-11 a.m. today. Beginning next week, walk-in interviews will be from 9-11 a.m. on Thursdays.

N

For additional information on the interview schedule or job opportunities, contact Space Center Houston's job line at 244-2177 or Human Resources Department at 244-2150.

themselves from potential harm. The training will discuss protective measures employees can implement to ensure their safety, and will provide employees with an understanding of the hazardous materials that may be found in the workplace. Bleam will be going out to the work areas to conduct the retraining effort.

The changes in JSC's HazCom program, and NASA's efforts to become the first federal agency to be accepted into OSH/ Protection Program requires retraining of employees. For additional information on the HazCom training, contact the Safety Learning Center at x36369, or Bleam at x36475.



visual image of each radar swath.

"By the time we get down, we hope to have about 12,000 CD-ROM's worth of data," Gutierrez said. ever attempted to do a mission like this one before. It's going to involve a lot of very precise choreography up there to get it all done." SRL-1 instruments include the Spaceborne Imaging Radar-C/X-Band Synthetic Aperture Radar and the Measurement of Air Pollution from Satellites instruments. The imaging radar of the SIR-C/X-SAR instruments have the ability to make measurements over virtually any region at any time, regardless of weather or sunlight conditions. The radar waves can penetrate clouds, and under certain conditions, can also "see" through vegetation, ice and extremely dry sand. An international team of 49 science investigators from 13 countries -Australia, Austria, Brazil, Canada, China. the United Kingdom, France, Germany, Italy, Japan, Mexico, Saudi Arabia and the United States --- will conduct the SIR-C/X-SAR research. The MAPS experiment will measure the global distribution of carbon monoxide in the troposphere, or lower atmosphere. These measurements will provide scientists with indican clean itself of "greenhouse gases." chemicals that can increase the atmosphere's temperature.

In addition to the crew's observa-

you can start to see what is happening on the surface. Maybe we can start to sort out what are people doing to produce these changes and what are going to occur naturally.

tions and photography, scientists and students on the ground will take verification readings.

"When you take a radar image of a planet," Apt said, "mostly what you see is the roughness of the surface, and in the case of being over trees and vegetation, you see how much of the radar signal has been absorbed and how much has been bounced by the trunks of the trees. We're mapping 5 percent of the world, and there are going to be things there that are aoing to be difficult to interpret. Having a visible image of the frame that the radar is mapping will help the scientists a great deal in interpreting their data. And they've asked for our help.

SRL-1 will provide a unique vantage point for studying how the Earth's global environment is changing, helping distinguish humaninduced environmental changes from other natural forms of change.

"When you're looking at things as in the sense of trying to measure biomass on the ground," Godwin said, "that's when you can start to see the changes and that is when

The radar may help figure out what happens to the water cycle and how does that water cycle through our Earth and air and back again and that affects all of us."

"These instruments are much like other NASA instruments that have flown on planetary spacecraft. Magellan had a very nice radar that just mapped the entire surface of Venus in the last few years. This is a much more capable instrument than Magellan's radar and we should learn proportionately more about the Earth's surface. Our planet is unexplored in many regions and we lack firm numbers on what's going on in the ecosphere and oceanography and the atmosphere in those regions. To apply these same techniques that we have applied to the other planets and turn them on our home planet is the payoff of this kind of shuttle mission."

"We're really looking forward to realizing the excitement of discovering new things about our own planet." Jones said, "as well as telling us what's going on in this world so that we can the right decisions about how to live on it properly."

the latest procedures."

The goal of JSC's HazCom training is to ensure that employees who may come in contact with hazardous materials are aware of the hazards and know how to protect

Space News <u> Roundup</u>

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

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

Editor	Kelly Humphries
Associate Editor	Kari Fluegel
Associate Editor	Eileen Hawley

Buyout in effect

(Continued from Page 1)

ing in the buyout program must submit an Application for Separation Incentive (Buyout) to the Employee Services Section, Bldg. 45, Rm. 140 by 5 p.m. April 15. All interested employees, even those who previously submitted their names to Employee Services, must complete and return the application to confirm separation date.

Headquarters will review the data from each center to determine how many of the applications for buyout will be approved, based on the funds available.

For additional information on the buyout program, contact Human Resources at x36251 or a benefits specialist at x32681.