



Try, try again

STS-49's creative solution to the Intelsat capture problem was a learning experience for many at JSC. Story on Page 3.



Galaxies collide

NASA's Hubble Space Telescope has revealed a new class of object in the universe. Story on Page 4.

Space News Roundup

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June 5, 1992

No. 23

NASA seeks vision from working troops

JSC team collects opinions in town meetings, on paper

By Kelly Humphries

JSC civil servants who aren't able to attend the last of three town meetings this morning but still want to get in their two cents-worth have until noon Monday to deliver written comments to the NASA Vision, Mission and Values panel.

Today's meeting is from 9 a.m. to noon in Teague Auditorium. The written comment deadline has been extended from close of business today to noon Monday.

NASA Administrator Daniel Goldin put the vision, mission and values team in action to synthesize from within NASA a unifying vision linking the agency's present and future activities, define its mission in the post-Cold War world and enunciate the shared values of the NASA team in fulfilling the agency's mission.

Two to three employees were chosen at each NASA center and Headquarters to facilitate the contri-

butions of agency workers. JSC's participants on the team are Nancy Robertson of the director's office, Norm Thagard of the Astronaut Office, and Bob Savely of the Information Systems Directorate.

"I'm personally excited about the opportunity," Robertson said. "Our goal here is to develop something a majority of NASA employees will sign up to support. I think the bottom line is that if the NASA employees do not support the mission

then, I don't think we can expect Congress and others to support it."

Robertson, Thagard and Savely met with their counterparts from around the agency last week, and will return to Headquarters next week to consolidate JSC's input with those from the rest of the centers. They'll summarize the agreed-upon vision, mission and values statements, together with dissenting views if necessary.

Please see **EMPLOYEES**, Page 4

Vision, Mission, Values

The deadline for written comments has been extended to noon Monday. Here's where to deliver them:

- Building 1, Room 106
- Building 4, Room 3010
- Building 12, Room 167

Retirement savings plan offers flexibility

If you're among the 20 percent of JSC employees who are covered by the Federal Employees Retirement System but still don't participate in the Thrift Savings Program, you may be short-changing yourself in the long run.

Even if you are participating, you may want to think again about how much you're contributing or how you're investing your savings during open season, which runs through July 31.

That's because FERS and the tax-deferred savings plan are geared toward personal financial responsibility — the creators of FERS assumed that employees would need to contribute at least 5 percent of their salaries to match a retirement under the old Civil Service Retirement System.

"For people under FERS, the Thrift Savings Plan is going to be absolutely essential for them to have an adequate retirement system at the end of their working careers," said JSC Human Resources Director Harv Hartman.

"If you put off enlisting, when you get to the end of your career you'll have Social Security and a very modest retirement," he explained. "If you participate fully throughout your career, you will have a plan to take care of your needs."

FERS employees aren't the only ones who can benefit from the plan, according to Carol Sanders of Human Resources' Employee Services Section.

CSRS employees also can benefit markedly from the tax break offered through TSP and 60 percent of JSC's CSRS employees contribute for that very reason.

The money employees contribute is taken out of their pay before federal income tax is calculated. That way, they don't have to pay taxes on that money until they withdraw it and that usually happens after they retire

Please see **TSP**, Page 4



JSC Photo by Benny Benavides

TIGHT SQUEEZE—The scarred underbelly of the Apollo 17 command module squeezes between flower beds in the Bldg. 2 breezeway on its way to Space Center Houston. The artifact, which has been on display in the Bldg. 2 Visitor Center is being moved to JSC's new visitor center, which is scheduled to open this fall. Riggers for Space Tech Services, Inc. transported the capsule and the lunar rover to their new home last week.

Columbia rolls to pad; launch set for late June

By James Hartsfield

Columbia arrived on station at Launch Pad 39A for STS-50 early Wednesday and preparations for a late June launch are under way.

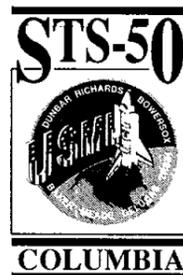
The STS-50 crew — Commander Dick Richards; Pilot Ken Bowersox; Mission Specialists Bonnie Dunbar, Ellen Baker and Carl Meade; and Payload Specialists Larry DeLucas and Eugene Trinh — will travel to Kennedy Space Center on Monday for a dress rehearsal countdown at the pad.

With the cargo bay doors closed and the United States Microgravity Lab-1 tucked inside, *Columbia* was mated with the fuel tank and solid rockets for STS-50 last weekend. At the pad this week, technicians tested connections between the launch pad and spacecraft and turned on the power to *Columbia*.

Shuttle managers plan to meet for a final flight readiness review, after which an official launch date

for STS-50 will be announced, on Tuesday.

Next up after *Columbia*, *Atlantis* was to move to the Vehicle Assembly Bldg. Thursday to be connected with the fuel tank and solid rockets for STS-46. *Atlantis* is



scheduled to be moved to Launch Pad 39B June 11, where preparations will begin for a mid-July launch with the Tethered Satellite System and the European Retrievable Carrier.

A countdown dress rehearsal at the pad for the STS-46 crew — Commander Loren Shriver; Pilot Andy Allen; Mission Specialists Jeff Hoffman, Marsha Ivins, Franklin Chang-Diaz and Claude Nicollier; and Payload Specialist Franco Malerba — will be held June 15 at the pad.

Meanwhile, *Endeavour* is back in Florida in the Bay 3 processing hangar. Technicians spent the week preparing to open the cargo bay doors and testing the aerosurfaces on the spacecraft.

JSC researchers rousting microbes with DNA fingerprinting

By Kari Fluegel

Advanced techniques used to place criminals at crime scenes now are being used in NASA's continuing investigation of microbial activity in the weightless environment of an orbiting spacecraft.

Medical researchers have investigated the possibility of microbial cross-contamination between astronauts confined to a spacecraft since the Apollo program. The advent of newer methods, however, such as

DNA fingerprinting which studies organisms at the molecular level, has allowed scientists to track the transfer of a specific microbe within the environment of the space shuttle, according to a joint study by JSC, Krug Life Sciences and the University of Texas Medical School.

Staphylococcus aureus was chosen as the target organism for the development of the tracking method because it is a common microbe carried in throat and nasal cavity of

about 20-40 percent of normal, healthy humans.

Though the grape-like clusters of most *Staphylococcus aureus* look identical, the DNA molecules within the microbe are unique and may allow a microbe to be traced to its original carrier. This technique is analogous to the use of DNA from a tissue or blood sample found at a crime scene to identify a criminal.

"We're exploiting the uniqueness of the individual at the most basic

level," said Duane L. Pierson of JSC's Biomedical Research and Research Branch.

On a recent shuttle mission, *Staphylococcus aureus* was isolated among several crew members during the microbial sampling portion of the routine pre- and post-flight physicals. Microbe samples also were collected from shuttle surfaces before, during and after the mission. DNA from the samples was extracted, cut into

Please see **DNA**, Page 4

Retires from U.S. Marine Corps

Astronaut Buchli to leave JSC for space station job

By Barbara Schwartz

Astronaut James F. Buchli will retire from the U.S. Marine Corps and leave NASA in August to become manager of station systems operations and requirements with Boeing Defense and Space Group in Huntsville, Ala.

Buchli, a Marine colonel, is a veteran of four shuttle missions: STS-51C, a Department of Defense flight in January 1985; STS-61A, the West German Spacelab D 1 mission in November 1985; STS-

29, a mission to deploy a Tracking and Data Relay Satellite, in March 1989; and STS-48 in September 1991 on which the Upper Atmosphere Research Satellite was deployed. In total, Buchli logged more than 490 hours in space.

Buchli also has served as deputy chief of the Astronaut Office since March 1989. Since becoming an astronaut in August 1979, Buchli has held a number of technical assignments, including spacecraft communicator in Mission Control

and in the Astronaut Office Operations Development Branch working on controls and displays for the shuttle and Space Station *Freedom*.

He has a bachelor's degree in from the United States Naval Academy and a master's form the University of West Florida.

"I'm grateful for my years of active service as a Marine and as part of the NASA team. It has allowed me to be a part of two of the finest organizations in the world. I'm looking forward to changing career direc-

tions and remaining involved with the outstanding people who make up our space team," Buchli said.

"Jim has made significant contributions to the Astronaut Office and to the space flight program during his tenure here. We'll miss him and wish him continued success. His experience on four space shuttle flights and his managerial abilities will be assets to Boeing in their Space Station *Freedom* efforts," Donald R. Puddy, Director of Flight Crew Operations, said.



James Buchli

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.

New Braunfels River Raft Trip (8:30 a.m.-10 p.m. July 11, includes transportation, 2-3 hour raft trip, barbecue dinner): \$36.

Les Miserables (8 p.m. June 18, Jones Hall): \$30, limit four.

Astros vs. L.A. Dodgers (2 p.m. June 20, Astrodome): \$7.

Fiesta Texas Park (San Antonio): adult, \$19.50; child 4-11, \$13.55.

Sea World (San Antonio): adult, \$18.90 (child free with paying adult); child 3-11 \$13.55.

Astroworld, \$16.95 and \$14.95 (child under 54 inches), \$44.95 (season pass) and Waterworld, \$9.50.

Six Flags, \$16.95 (one-day) and \$22.95 (two-day).

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

Upcoming EAA Events: River Raft Trip, July 11.

Metro passes, stamps, Walt Disney Club memberships 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.

Weight Safety — Required course for employees wishing to use the Gilruth weight room is offered from 8-9:30 p.m. June 10. Cost is \$5.

Defensive driving — Course is offered from 8 a.m.-5 p.m. July 11. Cost is \$19.

Country and Western Dance — Course meets Mondays for six weeks beginning June 15. The beginner class meets from 7-8:30 p.m. The intermediate class follows from 8:30-10 p.m. Cost is \$20 per couple.

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 classes meet from 5:15-6:15 p.m. Mondays and Wednesdays, beginning June 15. Cost is \$24.

Aikido — Martial arts class meets twice weekly. Cost is \$35 per month.

Softball tournament — Men's Open "C" Softball Tournament, June 13-14. Registration deadline is 7 p.m. June 11. Cost is \$95.

Tennis lessons — Beginner lessons will be held Mondays beginning June 1. Cost is \$32. Beginner-advanced lessons will be held Wednesdays beginning June 3.

Fitness program — Health Related Fitness Program includes medical examination screening, 12-week individually prescribed exercise program. Call Larry Wier, x30301.

JSC

Swap Shop

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

Property

Rent: Epcot, Disneyworld, 2 BR condo, sleeps 4, lg kitchen, microwave, stove, dishwasher, W/D, master BR has whirlpool, two nights/three days at Kissimmee, Florida, valued at \$350/night, sell for \$500 OBO, rental good through Oct. 1, 1992, not a time-share. Diane, 283-5618.

Sale: Friendswood, 3-2-2A, lg lot, landscaped, \$93K. Rick 335-4415.

Sale: League City, 4 BR, formal dining and living room. 332-7082.

Sale: Countryside, 3-2.5-2A, 2 story, lg fenced corner lot w/covered deck, all BR up, int util rm, \$66,900. 554-7623.

Rent: Bayglen, 3-2.5-2, 1.5 story, FPL, fans, jacuzzi, avail now, \$1025/mo. Ruben, x33829 or 486-0817.

Sale/Lease: Middlebrook, 4-2-2, new carpet, vinyl, paint, all formals, den. Morshed, 334-3984.

Cars & Trucks

'79 Ford Pinto body parts. Trey, 484-7834.

'87 BMW 325es, all options, leather int, new eng (16K), new brakes/tires, ex cond. 524-8908.

'74 Ford Bronco convertible, hard & soft top, 20K on new 302 V8, good body, \$5.2K, make offer; '88 Mitsubishi Mighty Max PU, auto, air, tilt, AM/FM/cass, bed mat & tailgate cover, camper cap, \$4.3K. 286-0633.

'85 Chevy Monte Carlo, V6, new paint, new tires, ex cond, \$3300 OBO. x38785 or 409-948-4887.

'86 Toyota Camry DX, 4 DR, auto, silver, A/C, AM/FM/tape player, 67.9K mi, ex cond, \$5.2K OBO. Sue, x34008 or 482-9408.

'90 Nissan Sentra, loaded, A/C, tint, stereo, alarm, new tires, \$6.5K OBO. x39045 or 333-9168.

'85 Audi 4000S, high mileage, runs great, white body, pwr windows/locks/sunroof, AM/FM/cass, \$2.5K OBO. x38893 or 482-8410.

'59 Chevy PU for restoration or parts; '80 Chevy van, good cond; '76 Datsun B210 2 DR Sedan. 771-1012.

'84 BMW 318i, 5 spd, maroon w/blk int, AM/FM/cass, A/C, alarm, sunroof, new tires, ex cond, \$5K. 680-4189.

'85 Chevy Cavalier, 4 DR, 4 cyl/2.0L, auto, 75K mi, new tires and brakes, ex cond. \$2.4K. 488-5522.

'87 Audi Coupe GT, red w/blk leather int, 68K mi, \$5.5K. Mike, x36632.

'79 Grand Marquis, 78K, runs OK, needs word, \$1.5K. Grady Owens, x33162 or 482-4158.

'86 Camaro, auto, 32K mi, ex cond, \$3.6K. x34413 or 280-8125.

'85 Chevy S-10 Blazer, 8.5K on rebuilt engine, clean int, \$5,950. 480-5615.

'91 T-Bird, all power, ex cond, alloy wheels, blk w/tinted windows, 16K mi., \$11.5K. 333-6791 or 334-2169.

Boats & Planes

15.5' Runabout 85HP Merc, everything incl ski equip, \$1.3K OBO. x39045 or 333-9168.

7' fiberglass dingy w/oars, very stable, \$250. Lisa, x38603 or Gary, 486-9620.

Cycles

'74 Yamaha 360 MX, ex cond, \$900. Roy, x34094 or 488-6326.

'89 Yamaha XT600, ex cond, low mi, \$2.4K. 480-3354 or 488-1953.

Honda Hobbie, moped, less than 1.3K mi, \$375. Rick, 335-4415.

'80 Yamaha 650 XS Heritage special, ex cond, \$1050. Aaron, 482-5777.

'81 Honda CB650, runs & looks good, 25K, 2 helmets, manual & tools, \$1K OBO. x33814 or 486-9760.

Audiovisual & Computers

Mac games, Sky Shadow, Crystal Quest, ex cond w/orig materials. 286-2213.

Atari 5200 w/25 games, \$125. 332-0365.

TRS-80, Model II, b/w monitor, two 5.25" disk drives, fully expanded 48K, Level II Basic, Fortran, \$150. 488-2157.

Lg assortment of IC's incl speech synthesizer, microprocessors, EEPROMS, prototyping boards, wire wrap sockets, \$110. Jesse, 332-6681 or 332-8869.

128K Apple IIe, mono monitor, two 5.25" drives, 1200 baud modem/super serial card, Epson MX80 printer free, \$295. Jim, x36897 or 777-7678.

Photographic

Minolta 50mm f1.7 lens, ex cond, \$50; Nikon 28mm f3.5 lens, ex cond,

Today

Cafeteria menu — Special: tuna and salmon croquette. Entrees: pork chop with yam rosette, Creole baked cod. Soup: seafood gumbo. Vegetables: Brussels sprouts, green beans, buttered corn, whipped potatoes.

Monday

Expert systems workshop — JSC's Software Technology Branch and IBM Corp. are sponsoring a series of workshops on verification and validation of knowledge-based systems at the Gilruth Center. The next workshops will be from 8 a.m.-4:30 p.m. June 8, 10, 15 and 17. For more information, call Chris Culbert, 283-8080; Bebe Ly, 283-8072; David Hamilton, 282-3857; or Scott French, 282-8346.

Cafeteria menu — Special: Italian cutlet. Entrees: braised beef ribs, chicken a la king, enchiladas with chili. Soup: cream of broccoli. Vegetables: navy beans, Brussels sprouts, whipped potatoes.

Tuesday

Cafeteria menu — Special: stuffed cabbage. Entrees: turkey and dressing, round steak with hash browns. Soup: beef and barley. Vegetables: corn cobbette, okra and tomatoes, French beans.

Wednesday

MAES meets — The Society of Mexican-American Engineers and Scientists Houston Chapter will meet at 11:30 a.m. June 10 at the American Host Hotel. For more information, call George Salazar at x30162.

Dates & Data

Astronomy seminar — The JSC Astronomy Seminar will be held from noon to 1 p.m. June 10 in Bldg. 31, Room 129. For more information, contact Al Jackson at 333-7679.

PSI meets — The Clear Lake/NASA Area Chapter of Professional secretaries International will meet at 5:30 p.m. June 10 at the Holiday Inn on NASA Road 1. Dr. Howard Leftin, author of "The Family Contract: A Blueprint for Successful Parenting" will speak. Dinner is \$10; for reservations or more information, call Cynthia Thomasen at 244-5840, or Pat Woolcock at 754-2570.

Cafeteria menu — Special: pepper steak. Entrees: catfish with hush puppies, roast pork with dressing. Soup: seafood gumbo. Vegetables: broccoli, macaroni and cheese, stewed tomatoes.

Thursday

AIAA banquet — The American Institute of Aeronautics and Astronautics will present its annual Honors and Awards Banquet at 5:30 p.m. June 11 in the Gilruth Center. Dr. Robert Bilstein, professor of History at the University of Houston-Clear Lake, will discuss "International Impact on the American Aerospace Tradition." Dinner cost is \$7 for members, \$8 for non-members and \$6 for students. Reservations are due noon June 8; call 333-6064, 283-4214, 283-6000 or 282-3160.

Cafeteria menu — Special: chicken fried steak. Entrees: beef taco, barbecue ham steak, Hungarian goulash. Soup: turkey

and vegetable. Vegetables: spinach, pinto beans, beets.

June 12

CLCTS meets — The ninth annual Clear Lake Council of Technical Societies Awards Banquet will be at 5:30 p.m. June 12 in the Gilruth Center. Joe Allen, president of Space Industries Inc., will speak. The outstanding technical person, administrator and educator of the year will be announced. Tickets are \$15. Reservations are due June 8; call Marcia Taylor, x30195. For more information, call Andy Lindberg, x31474.

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.

June 16

Inventors luncheon — The sixth annual JSC Inventors Luncheon will be at noon June 16 in the Gilruth Center, Rm. 216. JSC Acting Director Paul J. Weitz will present 39 plaques to JSC inventors. For more information, call the JSC Patent Counsel Office, x31012.

June 17

Astronomy Seminar — The Astronomy Video Tape Series continues during the weekly JSC Astronomy Seminars. "The Fastest Pulsars" with Dr. Tavani will be shown at noon June 17 in Bldg. 31, Room 129. For more information, contact Al Jackson at 333-7679.

\$85. Rob, x30762 or 992-4507.

Pets & Livestock

Free to good home, 3 kittens, 2 wks old, 1 blk w/blue eyes, 2 blk/grey striped. Pete, x38614.

Baby cockatiels and parakeets, hand-fed. Linda, 484-7834.

Free, 2 orange tabby cats, 2.5 yrs, declawed, neutered male, spayed female. Jennifer, x32774.

AKC Lab pups, born 3-13, YLW, 1st shots/dewclaws, strong FTC bloodline, ready 4-24, \$200. 244-9682 or 534-2176.

Musical Instruments

5 pc drum set w/hardware, \$200. x35180 or 326-3706.

Spinnet piano, good cond, \$500. Lisa, x38603 or Gary, 486-9620.

Yamaha PSR-48 kybd, five octaves, good piano sound, 100 voices, 100 rhythms, \$300 negotiable. Mike, x30758 or 480-5903.

Household

Rattan floral pattern sofa, loveseat, chair w/ottoman, coffee & end table, \$500 OBO; dining table & 4 chairs, negotiable; blue leather sofa, \$500 OBO. 280-5850 or 333-9078.

3 pc wht sectional couch w/southwestern color throw pillows, ex cond, \$450. 332-3984.

Antique style gray velvet overstuffed chair, dusty rose velvet chaise lounge, good cond, \$75/ea OBO. 538-3320.

Kenmore 19 cu ft chocolate side-by-side refrig, good cond, \$225. 339-3541.

King sz motionless waterbed w/padded side rails, \$75; King sz motionless 4-poster cherry stain waterbed w/padded side rails, was \$1.2K, now \$300. x32202.

Microwave/convection oven, ex cond, 1.5 cu ft, \$300. 992-1913.

Sofa & chaise lounge, charcoal gray, ex cond, \$1.2K. 795-5962.

Persian carpet, 100% silk, handmade, 3.5 x 5.5, \$4000; Persian carpet, wool w/silk flowers, handmade, 10 x 12, \$3.5K. 488-0345.

Sofa & loveseat, floral pattern, \$250; coffee table, \$50. 992-1466.

Lost & Found

Lost, ladies bicycle, 18", blue/green, Cycle-Pro, mesh covered basket, foam covered handlebars, last seen bldg 45, return to bldg 8 clinic or x37883.

Wanted

Will the Jim Martin who bought air cond from Kent Ward to pls return check or AC. T. Ward, 488-5445.

Skaters! Why skate alone? Join the Suburban Animals. Mike, x36632.

Want working or nonworking appliances, refrig, A/C, W/D, lawnmowers. 479-1608 or 476-0612.

Want nonsmoking roommate to share 2-2-2 house in Piper's Meadow, no pets, I have a small dog, \$300/mo plus 1/2 util, avail July 1. Tracy, x32526 or 486-3956.

Want patches, old, unique & rare, payload, experiment, division, any NASA/space related patch. 280-0647.

Want dependable babysitter for 6.5 yr old girl in our Heritage Park home, occasionally, as needed, must provide ref. 332-0442.

Want carpool rider from NW/Bear Creek to JSC/Clear Lake area, working 7 am to 4 pm. Racquel, x31810.

Want Nordic Track X country ski exerciser; nice home w/assum loan 5K or less equity. 334-2335.

Want small riding mower, running or not. x30626 or 479-5594.

Want adult baseball catching equip, catchers mitt, helmet and mask, chest protector, shin guards. Gerald, 283-5718 or 334-5377.

Want harmonica player searching for country band to play with. 333-6821 or 474-9155.

Want spaceshots series 2 and series 1 cards, buy/trade. Patrick, 282-3544.

Miscellaneous

Sears 2HP lawn vacuum, \$75; XCargo car top unit, \$20; Seagate ST-251 harddisk w/controller, \$100; EGA card, \$25; 2 MB-256K static column RAM, \$50. Roy, x34094 or 488-6326.

75 gal aquarium w/stand, incl under gravel filter, 2 pwr heads, 2215 Eheim aquarium filter, heater, Actinic lighting, 2 lg pieces of coral & many other accessories for salt water setup, \$300. 332-3984.

Super Twin waterbed w/all assy's, \$275 OBO; tool box for small PU, \$50. Tom, x31710 or 538-1581.

9' pool table, not slate, \$100 OBO. x35107 or 474-4742.

ProMaxima weightbench, gym quality, incl squatrack, preacher curl, leg ext, 255 lb Olympic weight set, weightstand, was \$750, sell \$500. x33125.

Acytelene/oxygen torch w/tanks & 3 brazing tips, \$250; double baby stroller, side-by-side, \$75 OBO. Ray, x30823 or 554-5434.

Radio Shack room monitor, \$45; Gerry double guard car booster seat, \$40; Panasonic answering machine, \$45. 286-0022.

.75 carat round diamond solitaire,

JSL quality, was \$4K, now \$1,750 OBO. Peter, 244-5578 or 286-8346.

Craftsman wood lathe w/copy crafter and 12 pc wood carving tools, was \$600, now \$300. 283-1834 or 332-4807.

Blk satin cocktail dress, ruffled peplum waist, open back w/draped pearl strands, white sequins, beaded flowers attached to shoulders, was \$150, now \$90. Connie, 484-2192.

The Furniture Idea Gift Certificate, expires March 1993, \$967. Karen, 538-3444.

Kirby dual Sanitronic vacuum cleaner, all accessories incl, BO. Ray, 282-5553.

Presidents & First Lady Health Club Premier Plus membership paid thru 2/30/95, \$900 OBO. Michelle, 283-5542.

24" diamond cut 14K rope necklace, \$400; 18" box chain 14K, \$95; 14K nugget pendant, \$45 OBO. 941-1512.

Pistols. John, 332-1570.

Southwest Airlines flight coupon, good for one round trip ticket anywhere they fly, valid til 7/11/92. Eric, x39055 or 334-4770.

Sears Craftsman riding mower, 36" cut, \$495; Mercury boat propeller 13.75 OD x 17" pitch, aluminum, \$75. 332-9105.

Two day beds, \$30/ea; Life & Ski jackets, wet suit, ski rope. Mike, x34710.

Concrete blocks, 12 x 12 x 2, \$1/ea. 489-9337.

Sewing machine, Bernina Mod 930, ex cond, \$400. 332-7082.

Aquarium, 175 gal, acrylic, incl heater modules, filters, pwr heads, lights, gravel, plants, and rocks, \$1K. Diane, 471-5291.

Golf clubs, Tommy Armour T-Line irons (2 PW), RAM SW Spalding driver & ping bag, \$150. Brad, x39279.

Chilton's Auto Repair manual, American cars from '67 to '74, hard cover, \$15; Chilton's Import Car Repair, manual '75 to '81, hard cover, \$15. Mike, 333-2335.

Little Tykes outdoor swing, \$5; Century musical potty chair, \$5; playpen, \$20, ex cond. Karen, 480-1658.

4KW electrical generator, 110 & 220 volt, \$300. Tex Ward, 488-5445.

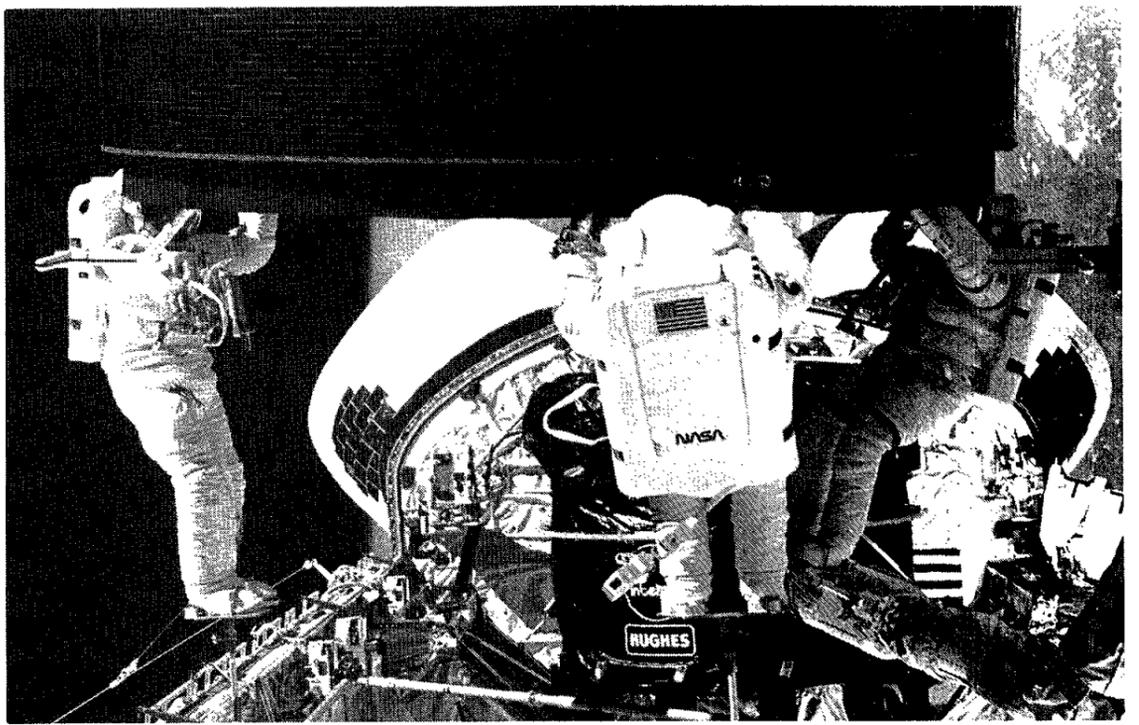
Electric hospital bed, ex cond, \$350. 488-3389.

Pink table lamp, \$10; 28" round decorative table, \$15; white storm door, \$50; 30" high bar stool w/back, \$15. 480-3424.

Solid oak dining table w/4 chairs, \$200; IBM PC, mono mintor w/Epson printer, \$400; DP rowing machine, \$30. 554-4710.

The Tough Keep Going

If at first it doesn't succeed, NASA team tries and tries again



By Brian Welch

Of all the lessons learned in the exhilaration of STS-49, perhaps the most enduring is that when things go wrong, the people of the manned space flight community have the ability to learn and adapt.

That feeling was echoed across the center last week, but at the same time, there was also the realization that when things go awry in space, the stakes suddenly seem very much higher.

Or so it appeared just before midnight on May 13 when an Intelsat VI satellite known simply as F-3 left the vicinity of the good ship *Endeavour* and sailed off toward a perch in geosynchronous Earth orbit. It was the most dramatic shuttle flight in recent memory, but for many of the commentators in our information-based society, nothing less than the future of Americans in space was riding on the outcome.

The flight definitely had the nation's attention. From Sunday to Wednesday of that week, phone lines into the JSC newsroom were jammed with callers offering suggestions. C-SPAN carried the third EVA from depress to repress. CNN led with the story hour after hour, and even Michael Keaton, also known as Batman, told Johnny Carson that it just doesn't get any more exciting than that satellite rescue.

In a May 15 editorial, the *New York Times* observed that the *Endeavour* crew's successful retrieval and repair of F-3 "saved the space program from ignominious prime-time failure." But the rescue, the *Times* intoned, "did not prove, as space enthusiasts claim, the importance of sending humans into space instead of robots. Instead, it proved almost the opposite—that costly manned flights should not be used to rescue replaceable satellites."

The *Times* went on to observe that "the halting performance of the space agency in handling *this very simple mission* (emphasis added) raises doubts that it is ready to perform the truly complex mission of the 1990s, the construction in space of an elaborate space station."

The *Christian Science Monitor* ran an editorial entitled "A Future for Manned Space Flight?" U.S. News & World Report said, "If *Endeavour's* crew had not succeeded, Intelsat would have lost an expensive industrial investment that an unmanned rocket was supposed to have placed in the proper orbit. But NASA, still reeling from the

Challenger disaster and the Hubble Space Telescope's myopia, might well have been devastated." The *Houston Post* said, "It is not over dramatizing the situation to say that if the *Endeavour* crew had failed in its third, final and quite risky attempt to capture the satellite, NASA would have suffered such damage to its reputation as to seriously threaten its future."

As *Endeavour* Commander Dan Brandenstein noted during the crew arrival ceremony in Houston, the mind boggles.

The question arises, have we come to the point in our risk-averse culture where the only way to succeed is to avoid a challenge? "The public and the news media must understand that things can go wrong," MOD Assistant Director for the Space Shuttle Program Randy Stone said after the flight. "When they do, we start afresh and go solve

problems. That's why we're here. For our part, we have to realize that we're accountable. Doing this in a fishbowl is a fact of life."

Brandenstein said the flight "didn't go quite as well as we planned, but quite often things don't." He reminded the welcoming crowd at Ellington Field that *Endeavour's* namesake, an 18th Century vessel of exploration commanded by James Cook, also had a rigorous maiden voyage.

"That mission didn't go perfectly either," he said. "He ran aground and damn near sank the ship. But he recovered, repaired the ship and made it back to England. He and his sponsors were so successful they went on to new voyages of discovery after that."

NASA Administrator Daniel Goldin said the lesson for students in his sister's class at P.S. 76 in Manhattan was to "expand, reach out, try." They were able to watch, he said, as adults met a problem head-on and kept trying until they were successful.

JSC Engineering Director Henry Pohl said STS-49 "was an excellent learning experience," and that learning how to live and work in space is, after all, one of the central goals of manned space flight. "It is not intu-

itive for human beings on Earth to think about operating in an absence of gravity. Another thing we learned is that it's the little, unexpected things that come back to bite you, and in this business they usually bite you very, very hard."

Perhaps the most important lesson, Pohl added, is that "there's no substitute for being there." The total accumulated EVA time on STS-49 was 59 hours and 23 minutes in four record-setting space walks. That accounts for more than 37% of all EVA time accumulated to date aboard the space shuttle, and more than 12% of the entire EVA experience of U.S. manned space flight. "We need to do these kinds of things more often," Pohl said.

For the hundreds of people who supported the flight, STS-49 was a final exam. "The team had to demonstrate all of its skills and dig down deep to make it successful," Stone said. "In my heart, I believed we were going to get it. There was never a point when anybody on the team thought we didn't have a shot at pulling this thing off. We train to be successful, we train to accept the first failures and the secondary failures and to look for solutions. That's the way we do our business."

To Flight Director Milt Heflin, whose Planning Team set some kind of a record with the Execute Package they pulled together the morning of the third EVA, STS-49 was a seminal experience for the space flight community, one that will have ripple effects downstream. "Many of the young people involved in this flight have never been through a real 'standup and be counted' situation like this. Completing the mission the way they did goes a long way toward bolstering their self-confidence in their own capabilities and the talents of the NASA team. They will carry that with them for a long time."

In the end, Henry Pohl believes, the talents necessary for continued space exploration are honed by the unknown, not the known. "We have to understand that if we are not allowed to stumble, then by definition we cannot succeed. That's how we learn. I remember the answer to just about every question I got wrong back in college, but I don't even remember the ones I got right." □



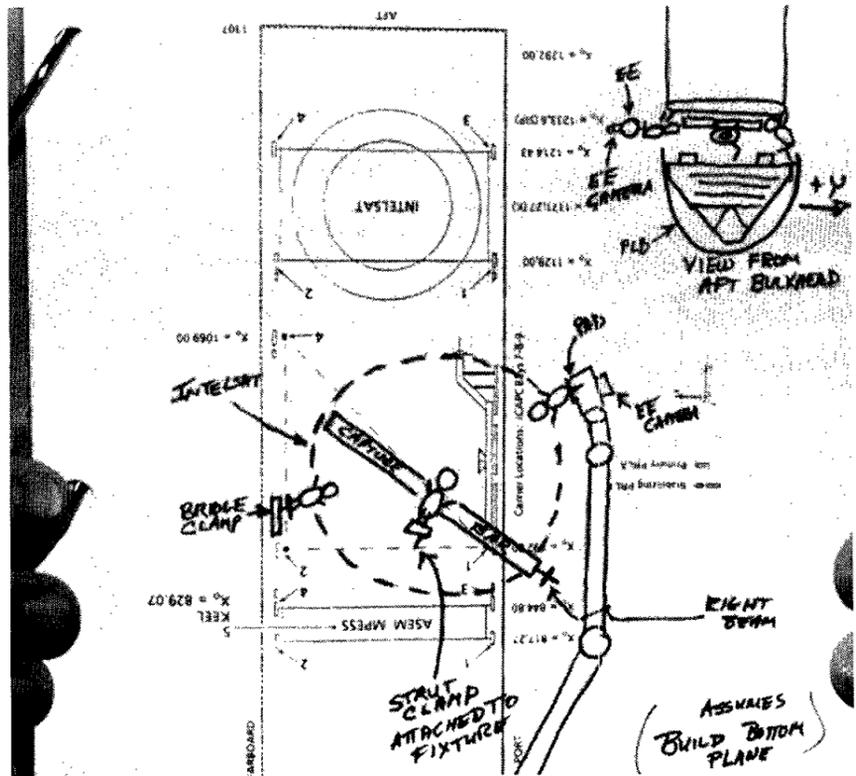
'We have to understand that if we are not allowed to stumble, then by definition we cannot succeed. That's how we learn.'

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'The public and the news media must understand that things can go wrong. When they do, we start afresh and go solve problems.'

—MOD Assistant Director for Space Shuttle Program Randy Stone



Top: Three men and a satellite get together in *Endeavour's* payload bay after brainstorming a solution to the Intelsat VI capture problem. Left: The STS-49 crew sketched its own ideas on using three space walkers to hand capture Intelsat and sent them down to Mission Control by way of this electronic still camera photograph. Above: Flight controllers, tiger team members and satellite experts huddle in Mission Control as options for the Intelsat rescue are discussed with the crew. From left are Orbit 2 Capcom Sam Gemar; Astronauts Story Musgrave and Jim Buchli; Team 4 leader Ron Dittmore; Comsat's Keith Voklert, deputy manager of the Payload Operations Control Center; Hughes Aircraft's Chuck Rubin, Intelsat reboost manager; and Randy Stone.

Hubble Space Telescope uncovers starburst galaxy

NASA's Hubble Space Telescope has revealed a new class of object in the universe — a grouping of gigantic star clusters produced by the collision of galaxies.

Images of the core of the peculiar galaxy ARP 220 show that stars are produced at a furious rate from the dust and gas supplied by the interaction of two galaxies.

The discovery was made by Dr. Edward Shaya and graduate student Dan Dowling, University of Maryland, College Park, and the Wide Field/Planetary Camera Team.

Astronomers have never before seen a "starburst galaxy" in such detail. The core of ARP 220 promises to be a unique laboratory for studying supernovas (the self-detonation of massive stars)

because they should explode frequently in gigantic young clusters.

Over time, the core of this galaxy should resemble a string of firecrackers popping off. This will provide astronomers an unprecedented opportunity to study the late evolution of massive stars, as well as possibly improve techniques for measuring distances to galaxies, which use supernovae as "standard candle" distance indicators.

In the 1980s, NASA's Infrared Astronomy Satellite observatory showed that ARP 220 is the brightest of a dozen or so "ultra luminous infra-red galaxies," which release 95 percent of their light in the infrared region of the spectrum.

Ground-based telescopic images show a dust lane down the center of ARP 220 that makes the galaxy

appear double lobed. Astronomers suspected that ARP 220's dark lane hid a massive black hole which provided the energy for heating intervening dust which re-radiates in infrared light. These new observations show that much of the energy is provided by giant star clusters. These star clusters will drive gas into the accretion disk around the black hole.

Astronomers doubted that an incredibly swift burst of star formation could explain all of ARP 220's luminosity. It now seems that the dust is heated both by the nucleus and the giant star clusters.

The new HST observation seems to confirm a 1988 theory by David Sanders of the University of Hawaii, which predicted that starburst activity is triggered in ARP 220 and other

ultra luminous infrared galaxies as a result of mergers of two giant spiral galaxies. Additionally, Joshua Barnes, University of Hawaii, and Lars Hernquist, Lick Observatory, University of Southern California, Santa Cruz, have calculated that when two spiral galaxies merge much of the gas and dust lose angular momentum and fall into the center. This high gas density would trigger a very high rate of star formation.

HST reveals for the first time six luminous knots that are super-bright star formation regions that lie within 2,000 light-years of the bright nucleus. These clusters are much brighter and 10 times larger than any previously known star cluster. The HST observers speculate there may be even more

super-clusters embedded deeper in the dust lane.

"We can now interpret previous microwave observations to estimate the clusters' age to be greater than 10 million years," says Shaya. "This means that they are no longer in the starburst phase."

Frictional forces, however, should draw these clusters toward the center of the galaxy where gravitational tidal forces should tear them apart within 100 million years. This limited age range adds further support for the galaxy collision scenario.

Since the clusters are young they must contain an abundance of massive short-lived stars. Shaya estimates that these should explode as supernovae several times per year.

Juneteenth picnic tickets now on sale

Tickets for the JSC Black Cultural Association's annual Juneteenth Picnic will be on sale until Wednesday.

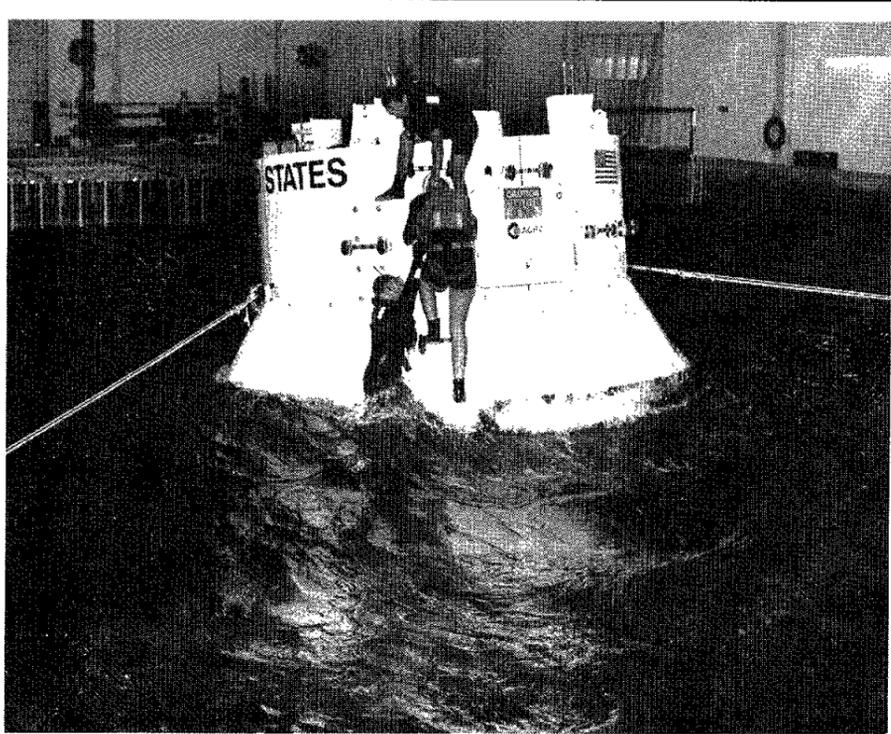
This year's picnic will be a special tribute to Astronauts Charlie Bolden and Fred Gregory.

The picnic will be from 3 to 9 p.m. June 19 at the Gilruth Center. A barbecue dinner will be served from 4 to 7 p.m. The longer hours are intended to provide a greater opportunity for more employees to participate.

Tickets, which are available from Black Cultural Association members, are \$10 for adults and \$4 for children under 12.

A softball tournament is planned, and this year's winner of the JSC BCA Ron McNair Scholarship Award will be announced. Last year's recipient was Jacquelyn Johnson, who received her bachelor's degree in mathematics from the University of Houston last month.

For tickets or more information, call JSC Black Program Manager Charles Hoskins at x34831.



STAYING AFLOAT—Subjects test egress procedures during evaluation of the Buoyancy Assured Crew Return Vehicle test article in the wave tank at Texas A&M's Offshore Technology Research Center. Engineers studied how to remove an ill or deconditioned crewmember from the ACRV under various wave conditions.

New guide offers career planning help

JSC employees soon will be getting some additional help in career planning once distribution starts for the new JSC Guide to Career Development.

The 19-page guide, which will be distributed this month, was developed in response to concerns and questions raised in past culture surveys of the JSC workforce and details the philosophy of and opportunities for career development at the center.

"At JSC we are committed to helping our employees develop to their full potential, both personally and professionally," said Harv Hartman, director of human resources. "We also have a responsibility to ensure that the center has the appropriate talent and skill mix needed to accomplish its mission."

"Effective career development provides a means to accomplish both these goals. Not only does it help employees grow as individuals but it also enhances their ability to contribute to JSC's future."

The guide provides an overview of the career development process; defines the roles and responsibilities of employees, supervisors and center management; examines alternative career directions; and identifies general career paths for technical, supervisory, program/project management, administrative, secretarial and technical careers.

The guide describes the knowledge, skills and development opportunities that are typical of different grade levels and provides examples of enrichment activities. It also lists center information resources and training/development opportunities which are available to help employees make career choices.

Quality Partnership nominations sought

Nominations are being accepted for the Quality Partnership Award, presented twice a year by JSC's Safety, Reliability and Quality Assurance Office.

First awarded in 1988, the honor recognizes individuals outside SR&QA who play key roles in helping JSC employees and support contractors reach a common goal of excellence.

The most recent recipients were George Stark and Robert Durst of Mitre Corp., who developed a set of measurements on which to judge the software testing process.

Nominations should be submitted to the Quality Assurance and Engineering Division, Code ND, by the candidate's peers or managers. The nominee may not work in the quality field or make direct contributions to the SR&QA Office.

The deadline for nominations is June 30. For more information, call M.C. Perry, chief of the Quality Assurance and Engineering Division, at x34352.

TSP key to retirement planning

(Continued from Page 1)

and their tax bracket goes down, Sanders said. By paying less current income tax, employees have more take-home pay than if they had saved the money after it was taxed. In addition, the investment earnings on the account are tax deferred.

"More and more employees are recognizing just how good the TSP is," she said. "In February, the plan crossed the \$11.83 billion mark with about 1.8 million federal employees participating."

"It's a way to actively manage your pension plan," Hartman said. "You have more flexibility than people have under CSRS. TSP gives you a lot more control over your future financial destiny."

The Employee Services Section is presenting a series of briefings this month and next to help answer employees' questions about the TSP. The first briefing was Tuesday, and the rest will be June 15 and 23, and July 8 and 23. All of the briefings will be from 1:30 to 2:30 p.m. in Bldg. 45,

Rm. 304, except for the June 23 briefing, which will be from 9:30 to 10:30 a.m.

When a FERS employee becomes eligible to participate, JSC opens an account and automatically contributes 1 percent of the person's basic pay. When the employee contributes, JSC will match that amount dollar for dollar up to 3 percent. The next 2 percent is matched 50 cents on the dollar. FERS employees can contribute up to 10 percent of their basic pay; CSRS employees can contribute up to 5 percent of their basic pay, but will receive no matching contribution.

Employees also may contribute a small amount — such as \$10 — and receive matching money.

TSP participants may invest their savings in three funds — the C Fund, which puts the money in stocks, the F Fund, which puts the money in fixed income securities, and the G Fund, which puts the money in U.S. government securities. That decision depends on personal circum-

stances and financial needs. A recent edition of Government Executive magazine includes an article by a financial planner suggesting some investment strategies, and Employee Services will have copies of that and other information at the briefings.

Participants may borrow against their savings to buy a home, pay for education or medical expenses or to use in case of financial hardship. The interest they pay on the loan goes back into their own accounts.

Career civil servants who leave government service before retirement will receive all of their contributions, all government matching contributions and earnings. The money can be transferred to an individual retirement account or to another eligible retirement plan and the tax deferral will continue.

Employee Services also has a detailed written description of the plan and the election form (TSP-1) available in Bldg. 45, Rm. 140. For more information, call x32681.

Employees to state visions for future

(Continued from Page 1)

Once the united team has prepared the draft statements, copies will be sent to all NASA employees for review and comment. Then, people outside the agency will be given a chance to comment. The final vision, mission and values statements are to be finished by mid-August.

The timetable for putting together the meetings and consolidating the JSC opinions has been brisk, but Thagard said he believes it's an effective way of doing business.

"That's the way you would generally like to do things — understand what you're going to do, do it and wrap it up," Thagard said. "I think that it's an unusual thing to do to ask the employees what they think the

agency's 30-year mission and goals ought to be."

The vision, mission and values statements will be used as a touchstone to guide NASA managers as they assess current ways of doing business and evaluate alternative approaches that can improve management, increase efficiency, save money, enhance schedules and reduce risk.

"Anytime you ask the work force what they think you ought to be doing and you make that what you do, it stands to reason that is going to increase productivity and morale," Thagard added.

Savely said he believes there is a whole spectrum of issues in America where NASA can play a role, and

that the agency's vision should include what it can do for the country not only in the area of aeronautics and space research, but in other areas such as technology and productivity enhancement.

"I think we have an opportunity to define where NASA is going to be 30 years from now," Savely said. "My field has been one primarily of technology utilization and transfer. I envision the commercial exploitation of space. I'd like to see a Disney World or Hilton in orbit. I believe NASA's mission should be to enable the commercial utilization of space."

Written comments must be delivered by noon Monday to either Bldg. 1, Rm. 106, Bldg. 4, Rm. 3010, or Bldg. 12, Rm 167.

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

DNA analysis assists in microbe studies

(Continued from Page 1)

smaller fragments and analyzed using Pulsed Field Gel Electrophoresis which separates the fragments and generates a pattern unique to the organism in the sample.

Investigators did not detect any transfer of the organism between the crew members during the flight; however, *Staphylococcus aureus* isolated in samples from the crew compartment was used to trace the specific microbes to their originators.

"This technique also has the potential to be another tool that would complement existing technology in forensic analysis," said George Weinstein of the University of Texas Medical School, one of the study collaborators.