



STS-50 crew members have been preparing for their role in the U.S. Microgravity Laboratory-1 mission. Photos on Page 3.



'Oscar' is back in Hollywood after a 4 million mile trip around the Earth aboard the Space Shuttle *Atlantis*. Story on Page 4.

# Space News Roundup

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No. 22

## NASA looks to Soyuz as lifeboat

JSC operations, integration engineers being recruited for study

By Billie Deason

This week's approval to negotiate a study contract between NASA and NPO Energia, a Russian space system design agency, heralds a new era of international cooperation between the world's two major space-faring peoples.

The basic contract, which includes follow-on options, kicks off a three-year joint study of whether the Soyuz TM spacecraft can be used as an interim assured crew return vehicle for Space Station *Freedom*.

"We're really excited about this study," said Jerry Craig, manager of JSC's Assured Crew Return Vehicle project. "All we need now is to add

some more of JSC's terrific engineering talent to our staff and get this thing under way."

Human Resources has issued a call for operations and integration specialists to participate in the Soyuz study. Contact Karl Schuler at x33031 for additional information.

"A number of things we learned during our visit to Russia in March encourage us that Soyuz might be attractive as an interim ACRV capability for *Freedom*," Craig said. "The study addresses all the major issue areas and should lead to some mutually agreeable approaches for solutions."

The ACRV preliminary feasibility

report issued last week identifies areas needing further review.

"Soyuz has been proven reliable over the years. We know it's a technically feasible system. We need to determine if Soyuz is programmatically desirable," Craig said.

Focal points of the study include expanding Soyuz's 180-day on-orbit service life, its crew sizing and capacity limitations, landing accuracy, its performance and safety as a water lander, and interface with Space Station *Freedom*.

Presently, a Soyuz is docked at Russia's Mir space station for six months at a time. Both operational effectiveness and costs would require

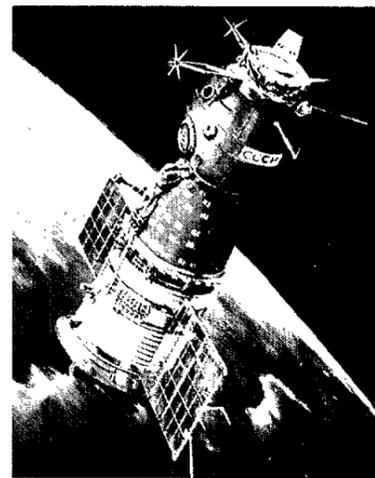
extending the vehicle's service life for use with *Freedom*.

Soyuz presently carries a three-person crew in smaller crew space than that needed for American astronauts.

"We thought the dry land landing aspect of Soyuz was so simply elegant there has to be something we can learn from them," Craig said. "We have to examine the craft's suitability for both dry land and water landings since we have limited open spaces compared to the Kazakhstan landing area."

"While we don't see Soyuz as the ultimate answer for ACRV, we see it

Please see **SOYUZ**, Page 4



NASA Photo

The Soyuz TM spacecraft is being seriously considered as an interim assured crew return vehicle for Space Station *Freedom*.

## Microgravity lab studies go from A-Z

By Kari Fluegel

Astronaut Dick Richards' only complaint about his two previous shuttle missions was that both flights ended too soon.

"Listening to that, the shuttle manager took it to heart and very shortly thereafter I was assigned to a 13-day flight to see if I can find that end point," he said.

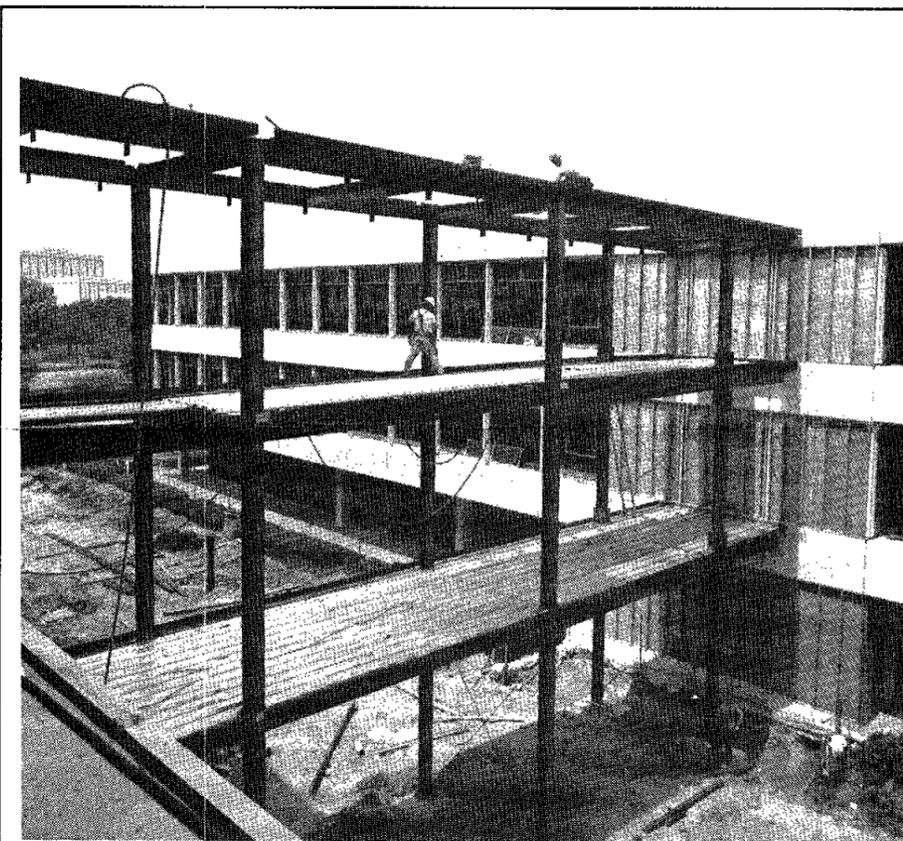
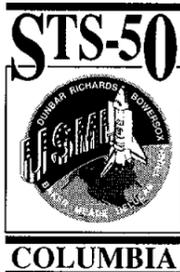
Specifically, Richards' reward is to serve as commander of STS-50, the

U.S. Microgravity Laboratory-1 mission, which is designed to set a new duration record for the Space Shuttle Program. The 13-day mission on *Columbia* is scheduled to be launched from the Kennedy Space Center in June.

Joining Richards' on *Columbia* will be Pilot Ken Bowersox, Payload Commander Bonnie Dunbar, Mission Specialists Carl Meade and Ellen Baker and Payload Specialists Larry DeLucas and Gene Trinh.

The seven-crew members will be

Please see **STS-50**, Page 4



JSC Photo by Mark Sowa

**HARD DOCKED** — Workers are about 60 percent finished with the new Bldg. 4 addition, and are making progress on the three-floor connecting passage. Concrete and structural steel work are complete on the main portion of Bldg. 4 South, and workmen are now beginning to install the roof and windows. Construction should be complete by Nov. 3, said Jay Hoover, construction manager for the Center Operations Directorate. Pepper-Lawson Construction Inc. is the prime contractor.

## Goldin forms review teams; revives logo

By Kelly Humphries

NASA Administrator Daniel Goldin announced Tuesday the formation of two teams that will encourage the agency's best minds challenge the content, timing, technology, management approach and schedules of NASA programs.

Along with the "red" and "blue" team formation, Goldin announced to all employees his decision to reinstate the original NASA insignia, affectionately known as the "meatball," and to phase out the NASA logotype known as the "worm."

"The object of the reviews is to explore options to improve the way we do business," Goldin said. "These teams are critical to the future of NASA. Unless we are willing to take our own fate in our hands, there will be lots of people out there who will do it for us. Believe me, you won't like what they come up with if we don't take the leadership that we've been trained to take on."

Team interaction should create constructive stress that will identify ways of doing same things better, faster and cheaper without compromising safety in all six of NASA's primary missions.

Acting Deputy Administrator Aaron Cohen will be in charge of the overall activities of the six red and blue teams, and will supervise an integration team that will

Please see **GOLDIN**, Page 4



## JSC Blood Bank offers security to employees

By Kelly Humphries

Thursday's blood drive will be the second of the year on-site for the JSC Blood Bank and for Helon Crawford it will mark some 25 years of service to the JSC-contractor community.

But Crawford insists on concentrating on the accomplishments of the blood bank, not her own.

"I just want the program to be good, it means a lot to me," Crawford said. "It's beneficial to the whole community, not just to the center. At moments, it's been the most rewarding thing I do out here at this center."

Crawford, a contract specialist in Administration's Data Systems Procurement Branch, has been donating her time to work on the blood bank since 1967. She has chaired the committee that coordinates the bank since civil service and contractor banks were combined in 1975 under the auspices of the JSC Exchange Council and the

Employee Activities Association.

The JSC Blood Bank operates under a contract with St. Luke's Hospital Blood Donor Program to assure the best possible benefits for employees who contribute. That includes providing blood for people with diseases such as hemophilia and leukemia, who are in constant need of blood, as well as people who are involved in accidents and have immediate, massive needs for blood.

The blood bank also helps senior citizens who have life threatening conditions that require blood on steady basis.

"Because we have a combined blood bank program, we have been able to help them," Crawford said. "Because we are such a large group, St. Luke's will do whatever we need them to do. The service we get beats anything I've seen elsewhere."

That includes offering the JSC Blood Bank any technological

Please see **BLOOD**, Page 4



JSC Photo by Benny Benavides

**TOWARD CULTURAL UNDERSTANDING** — Dr. Chiu-Nan Lai, the keynote speaker at last week's Heritage Day celebration sponsored by the JSC Asian Pacific American Program Council, meets with Asian Pacific Program Manager Pam Adams and council co-chair Dorothy Rasco. Lai, director of the Land of Medicine Buddha in Soquel, Calif., shared her thoughts on improving relationships between Eastern and Western cultures. The program's theme was "Unity in Diversity."

## Administrator makes communication, total quality appointments

NASA Administrator Daniel Goldin this week appointed a new associate administrator for continuous improvement and a new special assistant to the administrator for communications.

Laurie A. Broedling will serve as NASA's primary facilitator of Total Quality Management, and Bill Livingstone will advise the administrator on the agency's communications efforts.

Broedling's appointment is an important step in bringing a world-class TQM program to NASA, Goldin said.

"Laurie Broedling has an outstanding background on facilitating TQM and is regarded as an expert in the field," he said.

Before joining NASA, Broedling served in the Department of Defense as deputy under secretary for Total Quality, where she was responsible for overall direction of DOD's implementation of total quality principles

Please see **BROEDLING**, Page 4

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.

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.

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## 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.

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## 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: Nassau Bay TH, 4-2-2, master dn, 2000 sq ft, lg gar, deck, atrium, 2-story den, remodeled, \$1290/mo or \$119.9K. Jerry, x38922 or 488-5307.

Sale: Camino South, 3-2-2, well kept home in quiet neighborhood, two blocks from elem school, approx 1400 sq ft, \$68.5K. Mike, 282-3156 or 286-2387.

Sale: Egret Bay condo, 2-2 split, 2 balconies, 2 car carport, storage, sec gate, boat launch/pier, all major appliances, built-in microwave, FHA approved, \$59K. x33206 or 333-4692.

Rent: 3-1-1, gas range, refrig, W/D conn, fans, fenced, \$450/mo plus \$200 dep. Bill, 941-7731.

Sale: Univ Trace condo, 2 BR, new paint, W/D, pools, reserved parking, possible owner finance, \$35K. 286-1934.

Lease: Friendswood/Forest Bend, 3-2-2, fan, patio, fenced, new paint, new roof, refrig, \$695. 482-6609.

Lease: Heritage Park, 4-2-2, fans, split BR, fenced, new paint, \$725. 482-6609.

Sale: Friendswood, residential lot, 1/3 acre w/city util/gas, \$34.9K. David, 283-5374 or Laurie, 483-3748.

Sale: Heritage Park, 3-2-2, cul-de-sac, new ceramic tile kitchen, fans, blinds, alarm, ex cond, assume no approval, \$69K. Scott, 996-9396.

Rent: Cape Royale, Lake Livingston, Harbour Villa TH, near marina, sleeps 6. 334-5818.

Rent: Arkansas Lake cabin, furn w/antiques, screened porch, accommodates 8, \$250/wk, \$50/day. x33005 or 338-2517.

### Cars & Trucks

'77 Grand Prix, new eng, alternator, batt, and radiator, runs great, \$1250. David, 554-5514 or 282-3827.

'86 Chrysler Laser, lt blue, clean, \$3K. 856-0356.

'83 Buick Regal, 2 DR, auto, V6, AM/FM, A/C, \$1.2K OBO. 335-8549 or 280-0754.

'32 Allegro motorhome, needs work, \$3.5K. Brenda, x35965 or 280-0757.

'80 Toyota Corolla, eng need work, 2 new tires, \$475 OBO. Al, x31293 or 996-0054.

'83 Nissan Stanza LE, ex cond, 140K mi, new tires, struts, shocks, \$1250. x34621 or 980-7481.

'87 Porsche 924S, red w/blk int, PWR sunroof, Alpine alarm, Nakamichi stereo, shop manuals, records, very good cond, \$7K. Leonard, 283-4150 or 488-7616.

'90 Ford XL-250, 3/4 T PU, 6 cyl, 5 spd O/D, loaded, 28.5 K miles, ex cond, \$10.2K. 946-7587.

'77 Datsun 280Z, blue, 5 spd, split sunroof, alarm, custom wheels, nose bra, \$2K. 486-6681.

'90 Mitsubishi Galant LS, 4 DR, auto, A/C, AM/FM/cass, ex cond, low mi, elec doors and windows, cruise, \$12.2K. 484-9233.

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

'83 Jeep CJ7, cloth top, rebuilt eng w/10K mi, new radiator, new brakes, \$4.5K. George, x37005 or 470-8546.

'86 Toyota Camry DX, 4 DR, 4 cyl, auto, silver, A/C, AM/FM/tape player, 68K mi, alarm system, ex cond, \$5.5K. Sue, 482-9408.

'59 Chevy PU for restoration or parts; '80 Chevy cargo van, good cond; '76 Datsun B210 2 DR Sedan. 334-2335 or 771-1012.

'88 Lincoln Town Car, 53K mi, good cond, \$9.5K. 326-3008.

'88 Chevy IROC-Z, loaded, red, t-tops, 5.7L, V8, \$8K OBO. Greg, 286-0356.

'84 BMW 318i, maroon, 2 DR, AM/FM/cass, alarm, rims, ex cond. 680-4189.

'85 Chevy Monte Carlo, new paint, new tires, ex cond, \$3650 OBO. 409-948-4887.

'84 Audi 5000 Sedan, 4 DR, 45K mi, ex cond. \$5.5K OBO. 480-8721.

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

### Boats & Planes

'18' boat w/115 Evinrude motor w/trlr, \$2K OBO. Brenda, x35865 or 280-0757.

O'Brien Freesail Friendship sailboat w/sail, good cond, \$150 OBO. 283-4175 or 280-8645.

Mike Meyers' 6'2" surfboard, ex cond, neg. 488-4527.

'12' O'Brien Sensation sailboat, complete rig, \$275. 480-9448 or 282-3215.

14' 2 man sailboat w/trlr. Ed or Sharon, 333-5848.

Windsurfing Hawaiian, windsurfing gloves, sz small, \$15. Steve, 333-7819 or 474-5226.

'18' Prindle, dbl trapeze, new sales, ex cond, \$1.8K; 22'4 Gulf Coast sailboat, main, jib & spinnaker, new uphol, 6HS, Johnson, \$2.5K. Greg, x32259 or 474-7634.

Surfboard, longboard; modern, tri-fin, 8'6"; skid pad; shark skin bottom; was \$425, now \$200 OBO. 480-8133.

Sale or trade, ultra light AC. 409-762-6233.

### Cycles

MC-81 Honda CB650, runs & looks great, 25K mi, 2 helmets, manuals and tools, \$1K OBO. x33814 or 486-9760.

'89 Kawasaki Ninja, wht, 10K mi, needs front cowling, \$2.2K OBO. x35107 or 474-4742.

'79 Kawasaki KZ750, \$800; '80 Yamaha XS850, \$900; both run, neither have batt. 554-6533.

### Audiovisual & Computers

Lobo Max-80 computer, 64K, CP/M or LDOS OS, 8" drive, Hayes Smart-modem, Epson FX-80 printer, some software, all hardware manuals, Gorilla mono monitor, \$200. Fionnie, 538-1649.

Panasonic KX-F90 fax/phone ans sys/copier,

### Today

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

### Monday

**Fuzzy logic workshop** — JSC and the University of Houston-Clear Lake will host the third International Joint Technology Workshop on Neural Networks and Fuzzy Logic June 1-3, 1992 at the Gilruth Center. For more information, call Carla Armstrong, x39071.

**LDEF symposium** — Langley Research Center and the American Institute of Aeronautics and Astronautics will host the Second Long Duration Exposure Facility Post-Retrieval Symposium June 1-5 at the Town & Country Hotel in San Diego, Calif. Concurrent sessions in radiation, meteoroids and debris, materials, systems and science will be offered for all interested people. For more information, call Arlene Levine at 804-864-3318 or 864-3782.

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

### Tuesday

**STS-49 briefing** — The STS-49 crew of Endeavour will brief all JSC employees on the recent mission at 10 a.m. June 2 in Teague Auditorium.

**SFEI Meeting** — The annual general membership meeting for

Space Family Education Inc. will be at 4:15 p.m. June 2 in the Bldg. 30 Auditorium. All members are encouraged to attend. SFEI consists of parents and individuals interested in supporting the JSC Child Care Center. For more information, contact Reese Squires at x37776 or visit in Child Care Center.

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

### Wednesday

**Astronomy Seminar** — The third annual Astronomy Video Tape Series as part of the weekly JSC Astronomy Seminar will begin in June. "T.E.V. Gamma Ray Astronomy" with Dr. T. Weeks will be shown at noon June 3 in Bldg. 31, Room 129. For more information, contact Al Jackson at 333-7679.

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

### Thursday

**Blood drive** — The second on-site JSC Blood Drive of the year will be from 8-11:30 a.m. and 1-3:30 p.m. June 4 at the Gilruth Center. Appointments are required; call Mary O'Rear at x36531, Helon Crawford at x34159, or Dan Mangieri at x33003. For more information, call Crawford at x34159.

**Cafeteria menu** — Special: stuffed bell pepper. Entrees: turkey and dressing, enchiladas with chili,

wieners and baked beans. Soup: cream of chicken. Vegetables: zucchini squash, English peas, rice.

### June 5

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

### June 8

**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.

### June 10

**Astronomy seminar** — 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.

### 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.

new, warranty, \$450. x34600 or 409-345-4597.

Zenith Supersport 286 laptop. IBM comp, 1 M RAM/20MB HD/1.4 MB FD, backlit super-twist LCD screen, incl modem, batt, custom case & software, was \$3K now \$2.3K. Sheila, x32564 or Bob, 486-4711.

Loaded Compuadd IBM comp AT computer, 1 MB mem, 80287 math chip, 40 MB HD, 1.2 MB FD, 1.44 MB floppy, Hercules comp graphics card and monitor, Hayes comp 1200 baud modem & software, 2 parallel, 2 serial port, \$800; Teac PD-400 programmable compact disk player, \$65. Bill, 941-8991 or 480-0102.

### Pets & Livestock

Baby birds, hand-fed, cockatiels. Linda, 484-7834.

AKC German Shepherd pups, born 4-1-92, blk or sable, Rin Tin Tin bloodline, \$350. Len or Scott, 332-3210.

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

### Household

2 teak kitchen chairs, \$15/ea; 10' x 12' beige wall-to-wall carpet, incl foam cushion underliner, \$70. Ed, x36250.

Twin bed, extra long, 80", frame, matt, box springs, \$50. Leonard, 283-4150 or 488-7616.

Persian carpet, 100% silk, 5.5 x 3.5, hand made, master wall pc, was \$7.8K now \$4K; Persian carpet, 10 x 12, silk hillites, hand made, \$3K. 488-0345.

Twin sz bed w/frame, \$60. x33866.

Used Kenmore gas dryer, good cond, \$50. Jeanne, x38641.

Lt wood DR, table 40" x 60", w/inset leaf & pads, 4 chairs, buffet, 4 lg drwr & side panels, china closet w/2 glass doors, \$150; 3 matching pc, 1 yr old 72" sofa, lofeseat & chair, all beige background w/peach & green floral pattern, \$150; 3 matching tables, dark wood, mirrored glass inserts, brass trim, 27" sq coffee table, 2 end tables, \$100; 4 bookcases, approx 24" x 5, \$20/ea; two Fisher stereo speakers, one needs new woofer, \$50. Marianne, x33706 or 554-5818.

FCA 27" ColorTrack console tv, stereo monitor w/on screen programming, pecan cabinet w/swivel base, warranty. Angela, 282-4507.

Twin colonial style headboard/footboard, maple finish, \$60. 333-2830.

Sofa, tan corduroy fabric, 7.5' long, fair cond, free, x38578 or 334-5982.

10 cups auto rice cooker/steamer, \$20; solid brass vanity w/mirror and bench, \$100; Posture office chair, \$25; free CB radio, needs work. x36186 or x35046.

19" Sears color tv, good cond, \$65; wooden rocking chair, \$25; reversible king sz comforter, navy/red, was \$100 now \$35. 244-5035.

Lg & sm microwave, \$125 & \$75. 532-2158. King sz cherry stained waterbed, w/six drwr dresser & mirror, good cond, was \$1K now \$475. Teri, 480-5454 or 486-1430.

Microwave cabinet on caster wheels, 1 cabinet, 1 drwr, towel rack, cutting board area, microwave sits above cutting board area, \$50; Kenmore microwave oven, \$70. Suzanne, 335-

2896 or 286-1388.

Sofa, contemporary, off-wht w/striped pastel colors, 3 yrs old, \$125 OBO. 474-3438.

GE window A/C, 18,000 Btu, 220 V, \$200; Corning Ware china cookware, wet suit, convertible futon sofa/bed fram, \$250. 225-4064.

Brown semi-sectional sleeper sofa, \$100; entertainment center, \$50. Kim, x45425 or 559-2764.

### Lost & Found

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

### Wanted

Want enclosed util trlr approx 5 x 7, lg wheels and waterproof, charitable contribution or purchase. Rick, x33879 or 488-3945.

Want British motorcycle, BSA, Triumph, Norton, etc. Lou, 585-6267.

Want to share house in CLC by nonsmoking individual. Will pay 1/2 util & rent. George, x37005 or 470-8546.

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

Want sailboard sail, 5.0-5.4, partially or fully battened; stainless steel pressure cooker; heavy duty glass or stainless kitchen/bar blender. 486-9605.

Want outboard motor, 3hp - 5hp for raft, x39220.

Want swimmers, divers, water polo players and swim managers representing CL High School from '72 to present. Reunion will be held Sat, 6-27-92 at Seabrook Community House. 992-2582.

Want van pool riders, from Sugarland, Westwood Mall, Fondren and Loop 610 park & ride to JSC area. Alice, x35234.

Want students for beginner flute lessons, Pasadena area. 941-2495.

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

AIAA is looking for someone of Moroccan descent to represent Morocco at an Internat'l Space Year Activity on 7-14-92. Chris, 333-6866 or Larry, x34454.

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

### Miscellaneous

Golf clubs 1-SW, \$17/club perimeter weighted, metal wood 1,3, and 5 woods, \$35/club. David, 554-5514.

Aquarium set: Oceanic 26-gal, 36"L x 17"H x 13"W, w/beveled front corners, mirrored back, matched finished wood stand w/storage cabinet, aerator setup, bottom gravel, thermostat water heater, activated charcoal filtration system, artificial plants & rocks, fish breeding & aquarium cleaning accessories, chemicals & food, \$300 OBO. Cathy, 280-0754.

Self-propelled lawn mower, \$25; electric Weed Eater, \$5. Mike, x39095 or 486-9876.

Sofa, dbl sz sleeper, plaid design, fabric in fair shape, mech good shape, \$50; gutter attachment overhead rack w/ ratchet-strap tie-down, \$20;

rubber one-man raft, pump, paddles, \$15, other misc items. Ronnie, x32539.

Office desk, 5 drwr w/locking middle, wood laminate top 25" x 55", \$40. 482-3428.

Private comic book collection, over 2000 DC and Marvel titles. Lee, x31839 or 474-3176.

Wedding dress, gloves, hat & shoes, sz 8, cream colored, short sleeves, tea length, southern belle style, \$150. Sheryl, 481-4889.

Sears craftsman riding mower, ex cond, \$495; Mercury propeller, \$75. 332-9105.

Airline ticket, Hou to Denver, one-way, anytime before June 13, \$50. Jean, x35458 or 532-1460.

French doors for 5.5' entry, \$75. 282-3215 or 480-9448.

Two round trip tickets from Houston to London, England, British Airways, orig \$1.7K, sell \$550/ea. x35376 or 943-3842.

Floor standing, lg 6' x 5' classroom blackboard, aluminum frame, ex cond, \$125. 225-4064.

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

Cannon copier MP-350F w/colater, \$1.2K OBO. 334-3836.

'85 Corvette rims, \$200 OBO. x31769 or 334-3836.

Aluminum camper shell for shortbed PU, blue, sliding pass-thru window and side tinted windows, \$75. David, 283-5374 or Laurie, x33748.

Upright piano, \$350; complete BR set, solid wood, dresser w/mirror, chest of drwr, side table, queen bend-n-headboard, \$375 OBO, other misc furn. 941-8149.

Ex heavy duty car ramps, \$10; blue easy chair, \$15; Karate uniform w/kick shoes, \$6. x31612 or 488-0664.

# Extended Duration Experiments

**M**aterial science, fluid dynamics, biotechnology and combustion science in microgravity will be the research hallmarks of the first extended duration orbiter mission of the Space Shuttle *Columbia*.

STS-50 crew members have been through extensive training on the activation and operation of the 11 primary experiments that make up the United States Microgravity Laboratory-1 cadre in the Spacelab module.

Among the experiments they worked with in NASA's KC-135 zero-gravity simulating aircraft were the Glovebox Facility and the Surface Tension Driven Convection Experiment.

Counterclockwise from top left:

1) Payload Specialist Eugene Trinh floats with the STDC, which is designed to study the basic fluid mechanics and heat transfer of thermocapillary flows in microgravity. A better understanding of these flows could be important in improving Earth-based production of things such as molten glass, and help scientists develop better spacecraft water purification and fuel management systems.

2) Payload Commander Bonnie Dunbar, left, backup Payload Specialist Al Sacco, a photographer and Payload Specialist Lawrence DeLucas check out the Glovebox Facility between zero-gravity parabolas on the KC-135. The glovebox, provided by the European Space Agency, will allow crew members to handle, transfer and manipulate materials in ways that are impractical in the open

Spacelab. It also is equipped with photographic equipment and will allow a visual record of experiment progress. For USML-1, the glovebox experiments will involve fluid dynamics, combustion science, crystal growth and technology demonstration.

3) A photographer documents Mission Specialist Carl Meade's work with the glovebox. As part of the experiment, crew members will need to inject solutions into the glovebox using syringes.

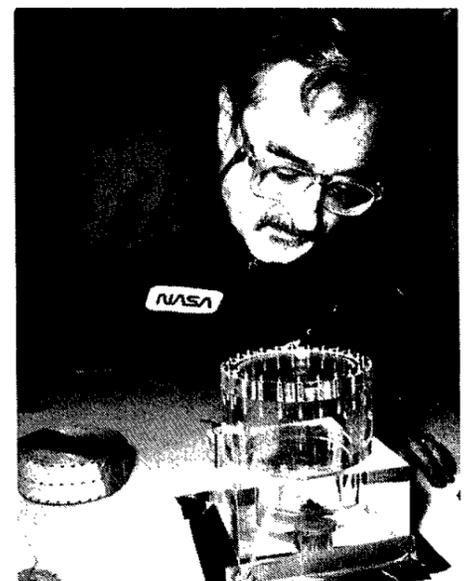
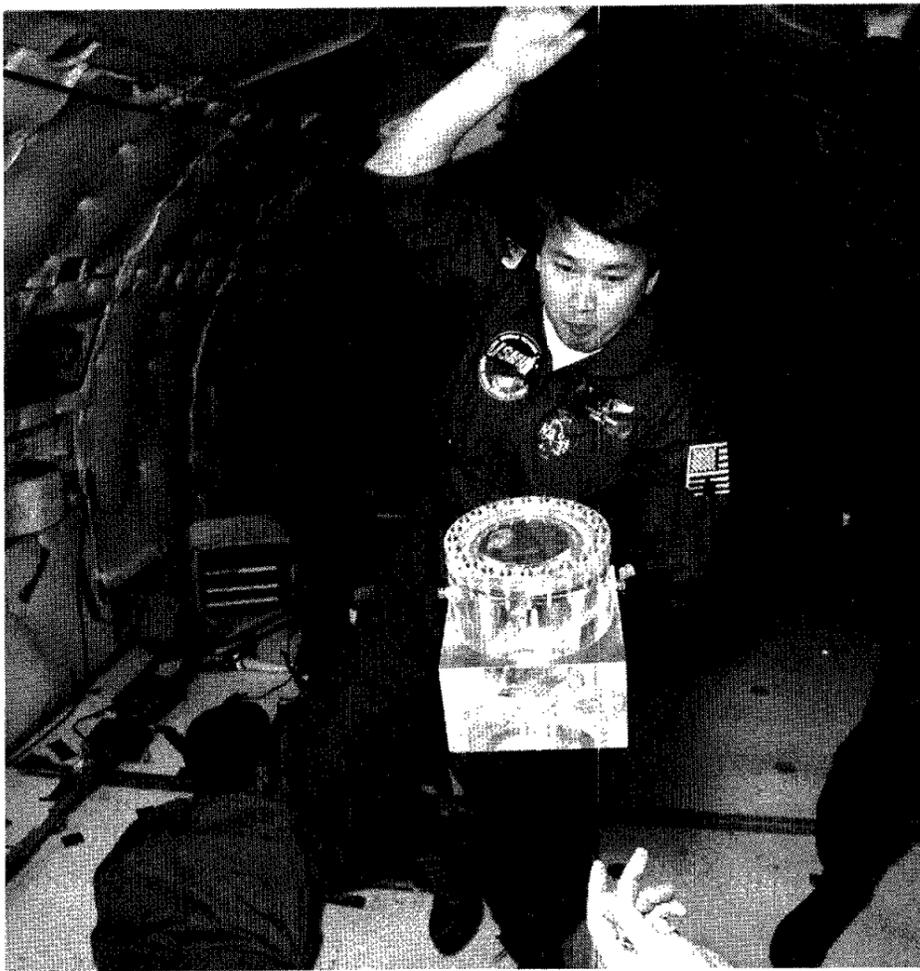
4) Pilot Ken Bowersox reflects on his lessons in emergency egress and water survival training.

5) Principal Investigator Si Ostrach of Case Western Reserve Univ. checks out his Surface Tension Driven Convection Experiment while it is taped to the floor of the KC-135.

Other USML-1 experiments include Astroculture, Crystal Growth Furnace, Drop Physics Module, Extended Duration Orbiter Medical Project, Generic Bioprocessing Apparatus, Protein Crystal Growth, Solid Surface Combustion Experiment, Space Acceleration Measurement System and Zeolite Crystal Growth.

6) The entire STS-50 crew poses in front of *Columbia* at Rockwell International's Palmdale, Calif., plant after its roll out following extended duration orbiter modifications.

The STS-50 mission also will build a database of experience for future operations on Space Station *Freedom* and conduct life sciences investigations into the human adaptation to space flight, with an emphasis on longer duration space flight. □



JSC Photos by Jack Jacob

# STS-50 crew calls flight challenging mix of experiments

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split into two shifts for around the clock operations in the Spacelab module.

"It's a challenging mix of experiments," said Dunbar, who will be making her third shuttle flight. "We have nearly 30 experiments represented by over 100 investigators in the areas of fluid physics and materials science. ... They actually literally go from A to Z — Astroculture from the University of Wisconsin at Madison and Zeolite Crystal Growth from Worcester Polytech."

Dunbar also said the training for the payload crew encompassed training for the USML experiments which use interactive science that will employ the human presence for identifying new phenomena and

perhaps changing the experiment over the 13-day flight and preparing to work with hardware that will require insight and possible repair or maintenance.

Meade, who will be returning to space on his second flight, will be performing extensive work with a glove box, an enclosed container with sealed gloves attached to it. Experiments can be placed inside the box and manipulated in the closed environment, protecting crew members from any toxic or hazardous materials.

"Although there are about 15 different experiments that go into the glove box, basically they are broken down into about three separate categories," Meade said. "The first category are experiments which essen-

tially support directly or indirectly the some of the other main line experiments. The second category of experiments are experiments which will contribute to the investigation of science or engineering in the development of future either equipment of future experiments for the Spacelab. Those general are in the fields of fluid mechanics and combustion science.

"Then there's a third independent type of category where most of the experiments are stand-alone investigations in the fields of fluid mechanics or techniques of crystal formation."

DeLucas will be spending much of his time working with the protein and zeolite crystal growth experiments and Trinh will be working with the

Drop Physics Module and the Surface Tension Driven Convection Experiment. Both, along with Bowersox, will be making their first space flight.

In their spare time, crew members will again work with Shuttle Amateur Radio Experiment. Richards and Baker will be the prime operators for the mission.

"It's one of those things that the more you learn about it and the more you play with it the more fun it is," said Baker who is making her second flight. "I've had a real good time learning how to operate it. Dick and I have both got our license and we're ready to make contact with all the hams out there when we have a few spare moments on orbit."

*Columbia* is expected to roll to

KSC's Vehicle Assembly Bldg. today to be attached to the solid rockets and fuel tank. It is scheduled to be transported to Launch Pad 39A on Wednesday.

Meanwhile, the other orbiters also are on the move. *Atlantis* will go to the VAB next week to be linked with the solid rockets and tank for STS-46, a mission set for a mid-July launch to carry the Tethered Satellite System and deploy the European Retrieval Carrier.

The most recent space traveler, *Endeavour*, was stalled from its piggyback trip home from California by unfavorable weather across the nation's midsection. Following a two-day trip atop the 747 carrier plane, *Endeavour* was planned to arrive at KSC late this week.

## 'Oscar' returns to Hollywood after shuttle voyage

After traveling nearly 4 million miles in space aboard the Space Shuttle *Atlantis*, "Oscar" returned home to the Academy of Motion Picture Arts and Science on Wednesday.

NASA Administrator Daniel Goldin and STS-45 Commander Charlie Bolden, along with crew members Brian Duffy and Dave Leestma, presented the space-faring statuette to Karl Malden, president of AMPAS.

The ceremony took place in the Bob Hope Lobby of the Academy's Center for Motion Picture Study in Beverly Hills. Also participating was Gil Cates, producer of the past three Oscar telecasts.

"Perhaps no other contemporary filmmaker's name is so synonymous with movies about space than George Lucas"—with the possible exception of Steven Spielberg, who presented the award to George," Cates said. "And because of that association with space exploration, it was natural to tie in our nation's

space program with the presentation. Taking the Oscar into space was the perfect way to do it."

"We don't go around letting Oscar take trips with just anyone, you know," Malden commented wryly, "but when Gil came to me with this idea, I felt confident that our Academy's symbol would be in good hands."

On March 30, the crew aboard *Atlantis*, along with a free-floating passenger named Oscar, participated in the 64th Annual Academy Awards festivities. After Steven Spielberg presented the Irving G. Thalberg Award to George Lucas, the world watched a videotaped salute to Lucas by the orbiting crew who hailed him as "an explorer in his own right."

Bolden praised Lucas by saying, "The imagination and ingenuity that have turned dreams into the reality of space flight are no different than those which turn ideas and inspiration into motion pictures."

## Blood bank taking deposits

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advances as they become available, such as for HIV testing, cholesterol screening, platelet donations, and a new bone marrow donor program just getting started.

All donors are eligible for cholesterol screening at Thursday's drive, but the bone marrow donor program is just beginning. A blood bank representative will be on hand to discuss the marrow donation program and will hand out information about the process, which involves overnight hospital stays for testing and matching, and travel to the hospital where the marrow is needed.

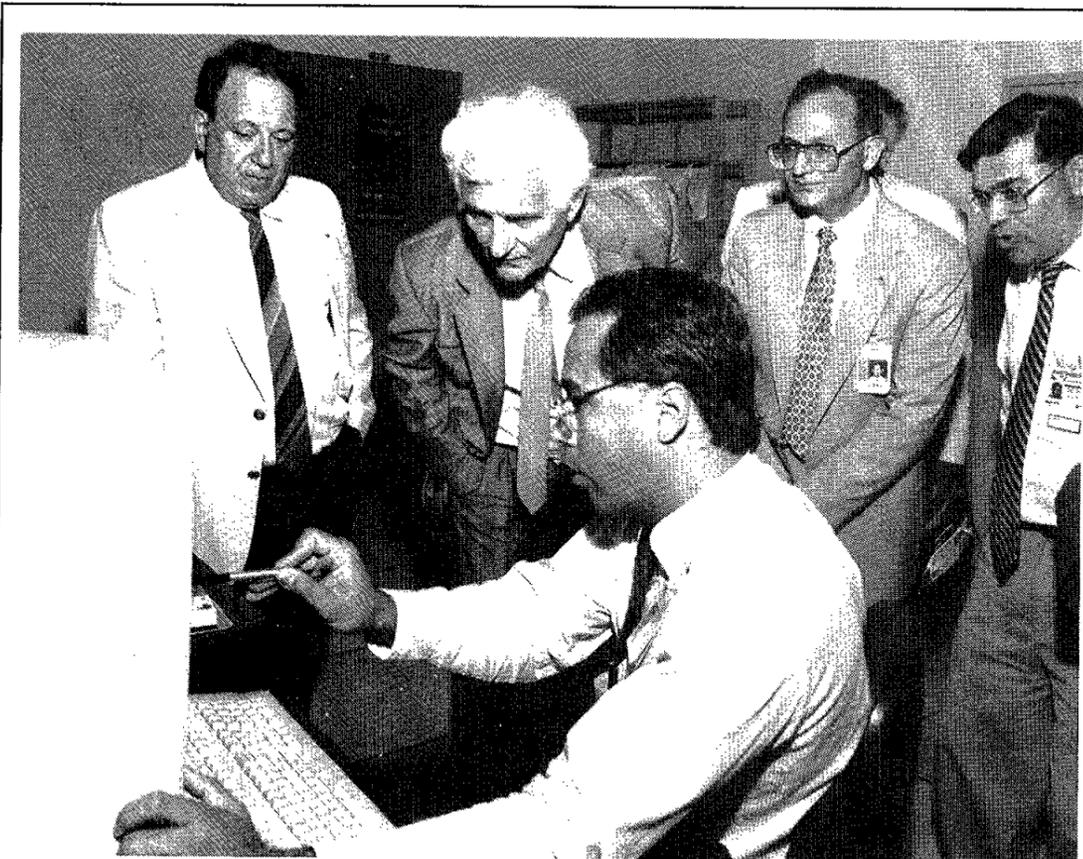
From an individual standpoint, it has meant that some employees could have desperately needed surgery they needed. Crawford cited one example of an employee who needed open heart surgery, but whose hospital ran into a blood bank crisis. Workers in the St. Luke's program hand-carried the blood that

person needed to the hospital and the surgery was a success.

"It really is a secure feeling to know that you've got this kind of a blood donor program going," Crawford said. "If I found myself in the hospital after an accident and needing surgery, I'd like to know that I've got that blood bank standing behind me."

Crawford said Thursday's blood drive — one of 50 that will be held on- and off-site by the combined JSC Blood Bank during 1992 — is expected to draw between 150 to 200 units of blood.

Employees are urged to call Crawford at x34159, or her assistants, Mary O'Rear at x36531 and Dan Mangiere at x33003, to set up appointments between 8 and 11:30 a.m. and 1 and 3:30 p.m. Anyone who must go to the drive unscheduled is asked to go after 2 p.m. so that the steady stream of about two donors a minute is not disrupted.



JSC Photo by Benny Benavides

**FRENCH VISITOR** — Professor Jacques-Louis Lions, president of France's National Center for Space Research, is briefed by Les Quicho of the Robotic Applications Laboratory in Bldg. 32. Accompanying him are Professor Roland Glowinski of the University of Houston, left, Kumar Krishen, JSC's chief technologist, right, and Lockheed's George Nasser, far right.

## Goldin picks red, blue challenge teams

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help resolve differences between the two teams. Assistant Deputy Administrator Charlie Bolden, who is responsible for Total Quality Management review activities, will oversee the day to day activities of the teams.

The team leaders, who were drawn from throughout the agency and met for the first time Tuesday, agreed they must be intellectually rigorous in challenging conventional wisdom and the status quo. The teams and their leaders are:

Aeronautics — Pete Petersen, blue team; Ray Hook, red team. Remote sensing — Lennard Fisk, blue team; John Casani, red team. Space access — Jeremiah Pearson, blue team; Lee Beach, red team. Human space presence — Arnold

Aldrich, blue team; Steven Hawley, red team. Robotic exploration — Lennard Fisk, blue team; Peter Burr, red team. Moon and Mars — Michael Griffin, blue team; Ken Szalai, red team.

The blue teams, made up of people already working on those programs, will review ongoing activities and look for ways of doing things better, cheaper, faster without compromising safety. The red teams will be "think tanks" imagining brand new approaches and playing devil's advocate with blue team's assumptions.

Goldin said the teams will put together a panel discussion in about two weeks to convey to all employees a deeper understanding of the teams and their objectives.

"We have a historic opportunity, and I am convinced we have the

brain power and ingenuity in NASA to respond to this challenge. I believe we can find significant economies in our current programs and use the savings to invest in new and aggressive space and aeronautics programs that will only strengthen America and offer hope an opportunity to our young people."

Goldin first announced the return of "meatball" in a Friday speech at Langley Research Center. He called the insignia a classic that will never go out of style, and said the transition will be gradual and should not be the cause of additional expense.

"This does not mean that as of today we will throw away stationary and repaint NASA vehicles," he said. "Let us not spend money on cards and paint. Let us spend it on developing advanced technology."

## Soyuz not ultimate assured return answer

(Continued from Page 1)

as something that might enable us to move permanent manning of our space station forward by as much as two years," Craig said. "When you think about the implications, it's a tremendous boost to the whole program."

While in Russia, NASA engineers also reviewed the automatic rendezvous and docking system used on both Soyuz and the unmanned Progress cargo vehicle. Their report says an adapter between *Freedom's* docking port and Soyuz could permit the craft to park at *Freedom*.

Still another facet of docking studies is an androgynous docking capability. Since both parts of this

hook-up device would be the same, any vehicle so outfitted could dock with any other vehicle or permanent space structure having the same mechanism.

The contract also allows U.S. life sciences researchers to study the findings of Russian investigators more thoroughly than previous informal arrangements.

"We may even fly some of our life sciences equipment s on MIR and get it certified earlier for *Freedom*," he said. The NPO Energia contract also permits a study of a wide range of Russian space capabilities and how they might apply to the U.S. program.

In addition to the study with NPO Energia, the European Space

Agency has initiated an effort to study the development of an ACRV as part of their cooperation in the Space Station *Freedom* program.

"ESA has proposed a non-Hermes ACRV, built to NASA's requirements. They are interested in an international cooperative venture."

Initial feasibility assessment was completed in February. Next week, NASA engineers will review the results of the second step in ESA's ACRV concept definition studies. If the results are positive, a Phase A study will begin in late July.

"If you look at our strategic plan, ACRV is a program that opens the door to establishing partnerships and broadening our resource base."

## Space News Roundup

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

## Broedling takes job as TQM facilitator

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and practices. From 1970 to 1989, she held several managerial posts in the Department of the Navy, including secretary to the Navy's TQM Technical Advisor, where she created the structure that institutionalized implementation of TQM across the Navy and Marine Corps.

Livingstone has been press secretary for then U.S. Senator and now Gov. Pete Wilson of California for the past seven years. Previously he was press secretary for U.S. Senator Jim McClure, R-Idaho.