



The Phase-1 Program is giving NASA and its astronauts the experience to live in space. Story on Page 3.



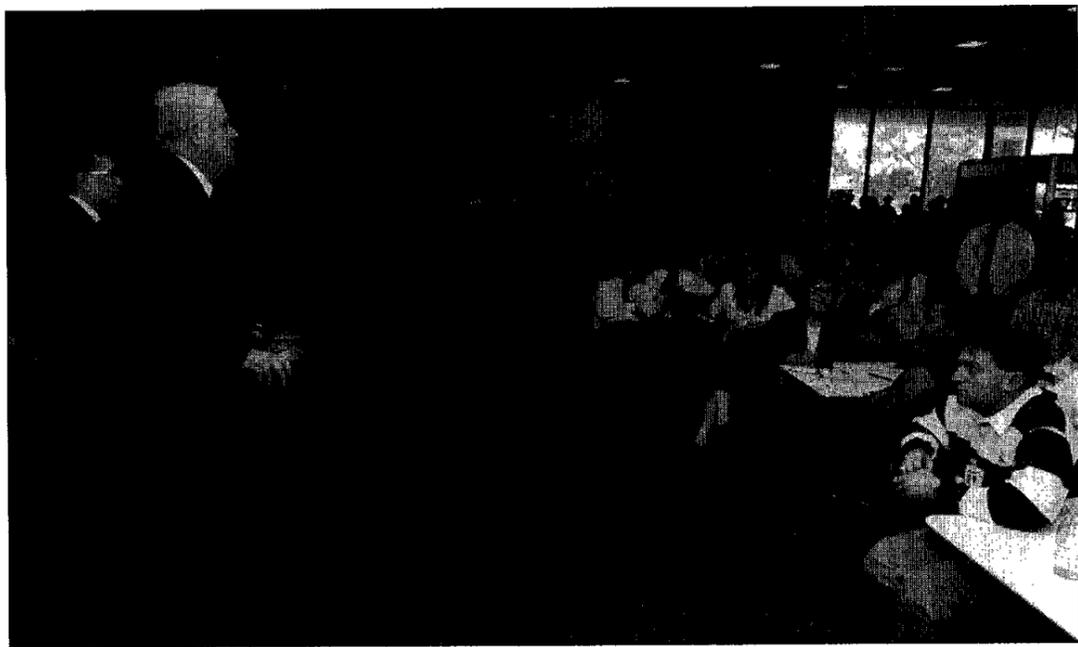
White Sands Test Facility receives Vice President Al Gore's Hammer Award. Photo on Page 4.

Space News Roundup

Vol. 35

March 8, 1996

No. 9



JSC Photo By Mark Sowa

Rep. James Sensenbrenner, R-Wis., talks with JSC employees in the Bldg. 3 cafeteria Monday. About 400 employees provides a standing room only audience for Sensenbrenner and Rep. Steve Stockman, R-Texas.

Chairman urges employees to deliver

On-time, on-budget space station key to solid future funding

The future chairman of the House of Representatives' Science Committee told standing room only audiences of JSC employees Monday that building the International Space Station on time and on budget is their best bet for ensuring a healthy space program in the future.

NASA's human space flight programs have stronger support in the current Congress than they have had for many years, Rep. James Sensenbrenner said, but NASA must prove it can deliver on its current programs before Congress will fund any future endeavors.

"In order for NASA to regain the stature and esteem in the eyes of the public that it had after the Apollo program we have got to get one thing done right and on-time and on-budget and that's the space station," said Sensenbrenner, who currently is chairman of the House Subcommittee on Space and Aeronautics. "The next step beyond that I think has got to be the Moon and Mars."

Sensenbrenner visited JSC on Monday and took the opportunity to talk with employees in the Bldg. 3 cafeteria and the Bldg. 30 auditorium. He was accompanied by Rep.

Steve Stockman, R-Texas. Both sessions featured full audiences and lively question and answer sessions.

The Wisconsin Republican said that while the continuing resolution funding government operations runs out March 15, Congress intends to pass another that will carry the government through fiscal year and require no additional furloughs. He said that NASA's human space flight initiatives are enjoying widespread support in Congress today.

"The overall picture of Congress Please see **NEW**, Page 4

Payload lab grows perfect crystals, metals

Scientists worked hand-in-hand across the country to conduct a variety of scientific experiments on STS-75 this week and made microgravity science history with the first control of an experiment from a college campus.

Mission Specialist Jeff Hoffman also made history last week as he set a new record for most hours flown on a space shuttle. Five days, 21 hours and 1 minute into the flight, Hoffman surpassed the previous record of 975 hours and 18 minutes held by Astronaut Kathy Thornton. By the time *Columbia* is back on the ground, Hoffman will have logged more than 1,000 hours in space.

Last week, flight controllers confirmed the Tethered Satellite System satellite batteries had expired as ground stations in Florida and Bermuda were unable to acquire its signal last Friday as the satellite passed overhead. The crew was able to view the satellite on a variety of occasions, collecting data for scientists from instruments in *Columbia's* payload bay.

"We have been getting messages from the science team describing some of the work that they are doing," Hoffman said. "Data have been obtained and it looks very exciting. In a few months from now at the International Tether Conference when these results are presented, it should be pretty exciting."

In addition to supporting science activities, the crew also took some time last Saturday to take a call from the Houston Astrodome.

"Everyone here at the Houston Livestock Show and Rodeo wants to congratulate you and everyone at NASA on your current mission," said Announcer Bob Tallman. "There are about 57,000 rodeo fans here tonight and all of us take pride in the fact that the your are doing a great job."

"We sure appreciate your good thoughts coming to us as we orbit the Earth," Hoffman said. "You know NASA is very interested in education of this nation's youth and we really appreciate the efforts of the Houston Livestock Show and Rodeo to develop scholarships and educational grants that have helped so many young people."

The United States Microgravity Payload got an extension day in space when mission managers decided to extend the flight by at least a day to support scientific investigations.

STS-75 Commander Andy Allen, Pilot Scott Horowitz, Mission Specialists Hoffman, Franklin Chang-Diaz, Claude Nicollier, Maurizio and Payload Specialist Umberto Guidoni said they were pleased with the decision.

"So much work and effort is put into getting a payload ready that if we have the opportunity to continue

Please see **SCIENTISTS**, Page 4



Gibson, Hawley take on new roles in Flight Operations

Astronauts Steve Hawley and Robert "Hoot" Gibson have taken on new roles in the Flight Crew Operations Directorate.

Hawley, a veteran of three shuttle missions before moving into management positions within NASA, has been returned to astronaut flight status and named to the crew of the second Hubble Space Telescope servicing mission. Gibson will replace Hawley as deputy director of Flight Crew Operations.

Hawley's mission, designated STS-82, is scheduled for launch in February 1997 on *Discovery*. Hawley's primary duty will



Hawley

be to operate the shuttle's 50-foot robot arm. He was a member of the crew of STS-31 which first deployed Hubble in April 1990.

Hawley, 44, will join astronauts Mark Lee, Greg Harbaugh, Steve Smith and Joe Tanner, all previously named as mission specialists on the flight. A mission commander and pilot will be named later.

In June 1990, Hawley left the astronaut corps to become associate director of Ames Research Center. He returned to JSC in August 1992 as deputy director of Flight Crew Operations. He joined the astronaut corps in January 1978

in the first group of astronauts selected specifically for the Space Shuttle Program. Hawley flew on shuttle missions STS-41D in 1984, STS-61C in 1986, and STS-31 in 1990. He has logged more than 412 hours in space.

Gibson became an astronaut in August 1979 and has flown five missions: STS-41B in 1984, STS-61C in 1986, STS-27 in 1988, STS-47 in 1992, and STS-71 in 1995. Gibson served as chief of the Astronaut Office from December 1992 to September 1994.

On STS-41B, Gibson was the pilot on the mission that deployed two Hughes communi-

cations satellites. Gibson was the commander of STS-61C that deployed the SATCOM Ku satellite and conducted experiments in astrophysics and materials processing. As commander of STS-27, Gibson and a five-man crew carried a Department of Defense payload. On STS-47, the 50th space shuttle mission, he commanded Spacelab-J, a cooperative venture between U. S. and Japan, and included the first Japanese astronaut. Most recently, Gibson commanded STS-71, the first space shuttle mission to dock with the Russian Mir Space Station.



Gibson

STS-76 crew prepares for third docking

Lucid to begin new era in space program

By Karen Schmidt

In less than two weeks, the U.S. will begin a two-year continuous presence aboard Russia's Mir Space Station that will prepare astronauts for living and working on the International Space Station.

Atlantis is expected to liftoff from Launch Pad 39B at 2:35 a.m. CST March 21 and dock with Mir about 43 hours after launch.

Atlantis and its crew of six—Commander Kevin Chilton, Pilot Rick Searfoss, Mission Specialists Linda Goodwin, Rich Clifford, Ron Sega and Mission Specialist/Cosmonaut Researcher Shannon Lucid—will remain docked for five days conducting a variety of joint sci-

entific experiments. *Atlantis* will carry logistics and hardware for the Mir 21 crew—Commander Yuri Onufrienko and Flight Engineer Yuri Usachev, who were launched to Mir on Feb. 21. Once *Atlantis* prepares to come home, *Lucid* will remain on Mir for more than four months.

"We are looking forward to successfully completing a rendezvous and docking so Shannon can join the Mir crew," Chilton said this week during the Terminal Countdown Demonstration Test in Florida. "One of the unique things about this flight is the total quantity of the equipment we are taking up. As we step forward into the space station era we are going to have to learn to transfer

large amounts of equipment efficiently and also bring back large amounts of equipment."

The Spacehab will house a number of experiments including the European Biorack experiment. Three days after docking, Godwin and Clifford, will conduct a six-hour space walk to attach experiments to Mir's Docking Module and to evaluate extravehicular activity hardware for the International Space Station. Chilton noted that STS-76 will feature the first operational use of the Simplified Aid For EVA Rescue, or SAFER, equipment. SAFER will be utilized because *Atlantis* will be hard docked to Mir and unable to rescue

Please see **ATLANTIS**, Page 4



NASA Photo

In the Spacehab Payload Processing facility the STS-76 crew checks out the payloads that will fly in the microgravity laboratory. From left are, Mission Specialist Ron Sega, Commander Kevin Chilton, Mission Specialists Mike Clifford and Linda Godwin.

JSC

Ticket 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.

JSC Picnic: March 31 at Astroworld. Tickets cost \$12 for the first 3,800, \$20 after. Tickets include all Astroworld rides and attractions, barbaque dinner and a free return ticket to Holiday in the Park.

Hockey: Houston Aeros vs Detroit Vipers 6 p.m. April 14 at the Summit. Tickets cost \$12.50.

Basketball: Houston Rockets vs. Denver Nuggets April 11. Tickets cost \$16.50 and \$22.50.

Space Center Houston: Discount tickets, adult, \$8.75; child (3-11), \$7.10.

Movie discounts: General Cinema, \$4.75; AMC Theater, \$4; Sony Loew's Theater, \$4.75.

Stamps: Book of 20, \$6.40.

Gold C books: \$10.

Entertainment 96 books: \$30.

Certificate books: Order popular brand coffees and cereals by mail and receive substantial discounts. Booklet cost \$30.

JSC history: *Suddenly, Tomorrow Came: A History of the Johnson Space Center.* Cost is \$11.

Metrotickets: Passes, books and single tickets 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 NASA badge or yellow EAA dependent badge. Classes tend to fill up two weeks in advance. Payment must be made in full, in exact change or by check, at the time of registration. No registration will be taken by telephone. For more information, call x30304.

EAA badges: Dependents and spouses may apply for photo identification badges from 7 a.m.-9 p.m. Monday-Friday; and 8 a.m.-4 p.m. Saturdays. Dependents must be between 16 and 23 years old.

Fitness Challenge: 1996 Fitness Challenge runs from March 1-Aug. 31. Employees are eligible to win \$100 gift certificates. For more information call Larry Wier at x30301.

Defensive driving: One day course is offered March 9. Cost is \$25.

Stamp club: Meets at 7 p.m. every 2nd and 4th Monday in Rm. 216.

Aerobics: New classes will begin April 2.

Women's self defense: Martial Arts training for women only from 5-6 p.m. Tuesdays and Wednesdays. Cost is \$25 a month.

Weight safety: Required course for employees wishing to use the weight room are offered from 8-9:30 p.m. March 28. Pre-registration is required. Cost is \$5.

Exercise: Low-impact class meets from 5:15-6:15 p.m. Mondays and Wednesdays.

Aikido: Martial arts class meets from 5-7 p.m. Wednesday. Cost is \$25 per month. New classes begin the first of each month.

Ballroom dancing: Cost is \$60 per couple. For additional information call the Gilruth Center at x33345.

Country and Western dancing: Beginner class meets 7-8:30 p.m. Monday. Advance class meets 8:30-10 p.m. Monday. Cost is \$20 per couple.

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.

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Dates & Data

Today

Writers conference: The Bay Area Writers League will host a writing conference at 8 a.m. March 8-9 at University of Houston-Clear Lake Bayou Bldg. Cost is \$95 non-members and includes membership into the Bay Area Writers League. For details, call Susanne Kolodzy 488-1128.

Astronomers meet: The JSC Astronomical Society will meet at 7:30 p.m. March 8 at the Lunar & Planetary Institute 3600 Bay Area Blvd. For details, call Chuck Shaw at x35416.

Cafeteria menu: Special: fried chicken. Total Health: vegetable lasagna. Entrees: pollock hollandaise, beef stroganoff, vegetable lasagna. Vegetables: steamed broccoli, carrots vichy, Italian zucchini, breaded okra.

Monday

Cafeteria menu: Special: meat sauce and spaghetti. Total Health: potato baked chicken breast. Entrees: wieners and beans, sweet and sour pork chop, potato baked chicken, steamed fish, French dip sandwich. Soup: cream of broccoli. Vegetables: French cut green beans, seasoned rice, California vegetables, buttered beans.

Tuesday

USRA lecture: The Universities Space Research Association will host a lecture at 8:30 a.m. March 12 at the Shriners Hospital Auditorium, 815 Market Street at UTMB, Galveston. Don Henninger will discuss "Advanced Life Support for Missions to the Moon and Mars." For information call Kay Nute at 244-2019.

SWAPRA meets: The South Western Aerospace Professionals Representatives Association will meet at 11:30 a.m. March 12 at

Space Center Houston's Silver Moon Cafe. Jim Reinhartsen will discuss "What's Coming to Clear Lake." For details, call Lisa Agnew at 283-4476.

Cafeteria menu: Special: smothered steak with dressing. Total Health: baked potato. Entrees: beef stew, liver and onions, shrimp Creole, baked chicken, fried cod fish, French dip sandwich. Soup: navy bean. Vegetables: steamed rice, cabbage, corn O'Brien, peas.

Wednesday

Toastmasters meet: The Space-land Toastmasters Club will meet at 7 a.m. March 13 at the House of Prayer Lutheran Church. For details, call Jeannette Kirinich x45752.

MAES meets: The Society of Mexican American Engineers and Scientists will meet at 11:30 a.m. March 13 in the Bldg. 3 Cafeteria executive dining room. For more information call Michael Ruiz at x38169.

Astronomy seminar: The JSC Astronomy Seminar will meet at noon March 13 in Bldg. 31, Rm. 129. An open discussion meeting is planned. For more information, call Al Jackson at 333-7679.

SSFF meet: The Space Station Future Fighters will meet at noon March 13 at Freeman Memorial Library, 16602 Diana. For information call David Cochran at 482-7005.

Cycle club: The Space City Cycle Club will meet at 5 p.m. March 13 at the Grumman Bldg. at Ellington Field. For more information call Mike Prendergast at x45164.

Cafeteria menu: Special: salmon croquette. Total Health: baked potato. Entrees: roast pork, stir frybaked perch, steamed fish, vegetable lasagna, Reuben sandwich. Soup: seafood gumbo. Vegetables: mustard greens, okra and tomatoes,

vegetable sticks, lima beans.

Thursday

HSBR lunch: The Houston Space Business Roundtable will host a luncheon at 11:30 a.m. March 14 at the Nassau Bay Hilton. Cost is \$12 for members and \$15 for nonmembers. For details, call Phyllis Thompson at 333-2209.

NPM meets: National Property Management Association will meet at 5 p.m. March 14 at Robinette and Doyle Caterers, 216 Kirby in Seabrook. Glenn Holt will discuss "Summary of Jupiter Probe Mission and Results." Cost is \$11 and includes dinner. Reservations are due March 12. For details, call Marie-France McDowell-Henderson at x39309.

Airplane club meets: The Radio Control Airplane Club will meet at 7:30 p.m. March 14 at the Clear Lake Park Community Bldg. For details, call Bill Langdoc at x35970.

Cafeteria menu: Special: stuffed cabbage rolls. Total Health: baked potato. Entrees: beef tacos, ham and lima beans, pork and beef egg rolls, steamed fish, catfish, French dip sandwich. Soup: beef and barley. Vegetables: Brussels sprouts, green beans, buttered squash, pinto beans.

Friday

Papers due: The American Institute of Aeronautics and Astronautics is seeking papers to be presented at the 21st annual Technical Symposium. For information call Charles Teixeira at x34647.

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

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 AP2, or deliver them to the deposit box outside Rm. 181 in Bldg. 2. No phone or fax ads accepted.

Property

Sale: 130 cleared acres, 5 pastures, 15 mi East of Tyler, house, hay & horse barns, all amenities. 488-5058.

Sale: Clear Lake, Oakbrook, 3-2-2, cul-de-sac, large lot, trees, ex condition, \$87k. 488-4069.

Sale: Laporte/Creekmont, 3-2-2, w/FPL, new roof, new carpet, linoleum, fresh paint, \$65.5k. 992-5080.

Sale: Boat slip on Clear Lake w/roof & motorized boat hoist for power boats, \$7.5k. 474-4922.

Sale: Santa Fe, Cedar, 2-1, new roof, 1 acre, lots of trees, deep well, custom kitchen, new amenities, \$55k. 409-925-1258.

Sale: Kirkwood South, 3-2-2 on large cul-de-sac lot, new roof, A/C & heat, alarm system, covered patio, deck, landscaping, \$73.5k. 484-2192.

Sale: Waterfront lot, .5 acres on Dickinson bayou, recent bulkhead, wooded, \$75k obo. x31370 or 334-7412.

Rent: Condo off El Dorado, 1-1-1CP, upstairs w/private entrance & balcony, immediate occupancy, \$380 mo + \$250 deposit, references required. Richard, x31488.

Sale: Wooded lot 90' x 135' in Taylor Lake Estates, \$39.5k can finance. Don, x38039 or 333-1751.

Sale: Bay Glen, 4-2-2A + 5th bedroom/opt study, over 2100 sq ft, large master bedroom & living room, covered patio, \$114.5k. 486-6726.

Sale: Webster condo, upstairs flat, 2-2-2CP, new A/C, solar screens, kitchen & bath upgrades, wetbar & FPL, ceiling fans, W/D conn, \$37.5k. 280-0285.

Lease: Bacliff Villas, 4-1.5-1, clean & cosy, fenced back yard, avail April 1st, \$575 mo + \$300 deposit. 488-0664.

Lease: Barringer Way condo, 2-1, W/D connection, pool, storage area, ex condition, no pets, \$495 mo. 486-2048.

Sale: League City, 3-2-2, 3 acres, barn, pond, beautiful setting, lots of trees, \$140k. 554-6138.

Rent: Arkansas cottage overlooking Blue Mt Lake & Mount Magazine, furnished, huge FPL, \$50/day or \$250/weekly. Corcoran, x47806 or 334-7531.

Rent: Galveston condo, furnished, sleeps 6, Seawall Blvd & 61st St, swimming pools, cable TV, weekend/weekly/daily rates. Magdi Yassa, 333-4760 or 486-0788.

Cars & Trucks

'85 Mustang 5.0 GT Hatchback, 5 speed, 90k mi, silver, \$2.5k obo. 332-3225.

'84 Mazda RX-7, GSL-SE, black/red, 5 speed, sunroof, AM/FM/cass, good condition, \$2,950. 582-0415.

'83 Mercedes, 300SD, ex condition, low mileage, \$10.5k. 488-3588.

'92 Pontiac Sunbird SE convertible, loaded, 4 cyl, auto, good condition, \$8.5k. x36228 or 409-848-1615.

'90 LeBaron Prem convertible, ex condition, low mileage, new tires, CD, leather, \$8.5k. 488-6526.

'90 Acura Integra GS, ex condition, garage kept, sunroof, AM/FM/cass, red, power windows, cellular phone, aluminum wheels, 5 speed, 1 owner, \$7.5k. Brent, x37834 or 488-6820.

'91 Honda Civic DX, 4 dr, white, ex condition, very clean, 30k mi, \$9.6k. 554-5492.

'90 Ford Taurus GL, ex condition, \$4.1k. 334-7773.

'86 Honda Accord DX, good condition, \$3.7k. 334-7773.

'72 Corvette Coupe, numbers matching 454, auto, A/C, PW/ PB, bright yellow w/dark saddle leather interior, professional frame-up restoration, \$16.5k. Brett, x34565 or 333-6415.

'80 Ford Bronco, 4x4, great condition, \$3k. Rick, 332-3866.

'76 Chevy Suburban, good school vehicle, \$750. Rick, 332-3866.

'85 Audi 5000S, 4dr, 62k mi, ex condition, sunroof, A/C, \$3.3k. x38151 or 532-1100.

'90 Honda Prelude SI, black/black, sunroof, 5 speed, new brakes, looks & runs great. \$8.5k obo. 334-7961.

'91 Olds 98 Regency, 60k mi, ex condition, \$11,950 obo. 480-2978.

'79 Porsche 911, white/brown, A/C, 100k mi, \$10.9k. Steve, 486-8047.

Boats & Planes

Procraft Bass boat, 15', 85Hp Evinrude, SS prop, 12/24 trolling motor, depth finder, 2 live wells, garage kept, very clean, \$2.5k. David, 478-2974.

'94 SeaRay SeaRayder, 14', 90Hp jet, less than 25 hrs use, accessories, warranty, garage kept, ex condition, \$6.5k or take up payments. x47922 or 331-8521.

Sailboard, Erratic Bat, complete rig, fiberglass mass 5.7 or 7.5 Gastra sail, \$450. Brent, x37834 or 488-6820.

'91 Yamaha Waverunner, 500 cc, low hrs, \$2k obo. 337-4637.

Cycles

'91 Suzuki Intruder 750 cc, red & chrome, clean, 18k mi, extras, \$3.5 obo. Marvin, x36174 or 713-592-6328.

Audiovisual & Computers

Citizen Printer "CSX-140" w/GSX color option, ex condition, \$199. Magdi Yassa, 333-4760 or 486-0788.

Amiga 1000 computer, Epson MX-80 printer, modem, software, cheap. David, 282-5338 or

488-7591.

Monitor, 14" color, NEC Mac sync, Mac compatible, \$150. 286-0592.

Magnavox combination amplifier/tuner/record player/cassette deck w/remote, \$125; Magnavox 5 compact disc changer, \$75. x30122.

Mac LC 70 w/color monitor, Stylewriter & lots of software, ex condition, \$850. Kristi, x32446.

CompuAdd 386 w/1.2 MB 5.25" drive, 40 MB HD, 14" Sansung CVGA monitor, mouse, misc S/W, Panasonic KPX-1124i (24-pin dot matrix printer), \$500 obo; IBM PCjr, w/expansion chassis, IBM color monitor, 640k RAM, 2-5.25" drives, \$100 obo. Richard, x31488.

486 DX2-66, 8MB, mini-tower, \$695; Compaq 386, 4MB, \$395; Pentium 75/100/133 new in box, \$989/\$1059/\$1219, full warranty. Don, 333-1751.

2 Macintosh Se computers w/ 2 Image writer II printers, \$325 per set. 484-1779.

Next Station turbo computer, 17" monitor, Mathematica software, \$2.6k. 991-0821.

Nintendo unit w/1 controller, GamePro magazines, several games some w/strategy guides. Ben, 476-4457.

Atari 520ST w/color monitor, \$140; Atari 1040 ST w/color monitor, \$190; dot matrix printer, \$50; 1200 baud modem, \$25. 482-5393.

Musical Instruments

Electric guitar, Peavey Predator Ax, \$375 new make offer. 554-6200.

Pets & Livestock

Free cat, 2 yrs, yellow striped male, neutered & declawed, some supplies. 212-1396.

AKC black Chow puppies, 3 males, 3 females, born 12/14/95, \$150. Curtis Terry, 471-2038.

Household

King size mattress, firm, matching boxspring from Gallery furniture, ex condition, \$200. Gina Sicking, 212-1377 or 486-0513.

G.E. electric oven, 27", copper-tone, built-in, wall-mount, works great, \$50. Linda, 484-0987.

Sleeper sofa, ex condition, floral design, must see to appreciate, \$150. Greg, 335-7184.

Futon, contemporary black metal futon frame, queen size, Aztec futon cover, ex condition, new \$500 sell \$280. 286-0592.

Litton microwave, old, works well, good for office use, \$25. 488-4463.

Dining room table w/6 chairs, obo. 486-7909.

Portable Kenmore dishwasher, ex condition, \$150; blue recliner, \$70; slid oak chairs, ex condition, \$50/pair; antique rocker frame, no seat or back, \$25. Merrell, x37570.

Western style 6 piece family room furniture, \$550. 286-0022.

Pappasan chair, good condition, \$40. Lisa, 244-0213 or 554-4140.

GE 30" electric stove top unit, working, \$45. x36090 or 488-7427.

Whirlpool "Thin-Twin" washer/electric dryer combo, ex condition, \$385. 488-4463.

Walnut-stained bedroom suite, American Colonial style, full/queen headboard, 2 night stands, mirrored dresser & tall chest, \$350. 388-7329.

Hutch, 5'3" x 6'6", solid pecan, beveled glass doors on top, storage in bottom w/heavy brass door handles, new \$2.2k sell \$500. Cindy, x32645.

Super single waterbed, includes headboard, 6 drawers in base, mattress & heater, \$100 obo. x37066 or 286-4255.

Armoire, antique, mother-of-pearl inlay, single door w/oval mirror, \$350. x35484 or 486-5286.

Bedroom set, full size, antique green w/dresser, 5 drawers chest & 2 night stands, Italian design, great condition, \$950. Magdi Yassa, 333-4760 or 486-0788.

Queen sleeper sofa, taupe weave, \$125. Mark, x30918.

Sears clothes dryer, large capacity, \$200. 554-6200.

Wanted

Want Personnel to join Vanopol departing Meyerland Park & Ride lot at 7:05 am for JSC, consists of on-site personnel 8 am/4:30 pm shift. Pipkins, x35346.

Want Champion juicer. 474-4922.

Want roommate to share 5-2-2, El Lago, all bills paid. 333-6821 or 326-2093.

Want non-smoking roommate to share 3 bedroom townhome in the Clear Lake area, \$350 mo w/bills paid. John, x30543 or 286-7384.

Want housemate to share 3-2.5, 4 story waterfront townhouse near South Shore Harbor area, amenities include community pool, private hot tub & tanning bed, 2 bars, 2 decks overlooking canal, boat slip, loft study, enclosed garage, lots of storage space, \$550 mo + 1/2 utilities. Terry, x39234 or 335-0113.

Want canoe. 482-3428.

Miscellaneous

Ballys Gold Charter Membership, \$300/\$74 dues per year. Trudy, x33117.

Ladies Blue Fox jacket, ex condition, \$300. Linda, 484-0987.

Fish tank, 48 gal w/undergravel filter & 2 overflow filters w/gravel cleaning attachment, salt & fresh water equipment, \$350. 943-7139.

Murray 20" side discharge lawnmower, runs great, no bag, \$40; Weedeater 1400T, 15" cutting path, doesn't run, \$5; 9 T-posts 5.5" & 6", \$1 ea. Rich, x47257 or 996-7630.

Small Igloo dog house, \$10; bicycle carrier for car or van, \$5. x38389.

Desert Eagle 44 MAG w/laser sight, 2 clips, 100 rounds & custom Desert Eagle carrying case, \$725 obo. Ken, 244-0280 or 996-0618.

Skiier exerciser, \$25. 554-5492.

7mm MAG Browning A-bolt w/Leupold 3x9 50mm objective scope, matt finish w/synthetic stock, gun case w/sling, ex condition, \$550 obo. Ken, 244-0280 or 996-0618.

Yazoo 5 Hp, 24" cut, professional walk-behind

lawn mower, 20" wheels, \$400. x33213 or 996-8020.

Ready to fly R/C Goldberg Anniversary J-3 Cub, Webra .61 engine, Jr 5 channel radio, complete w/starting kit, 4450. Neal, x33211.

Deer rifle, Weatherby Vanguard VGX, 30.06 caliber, Redfield Tracker 3x9 scope, sling, hard case, \$650 obo. Dennis, x32638 or 482-7237.

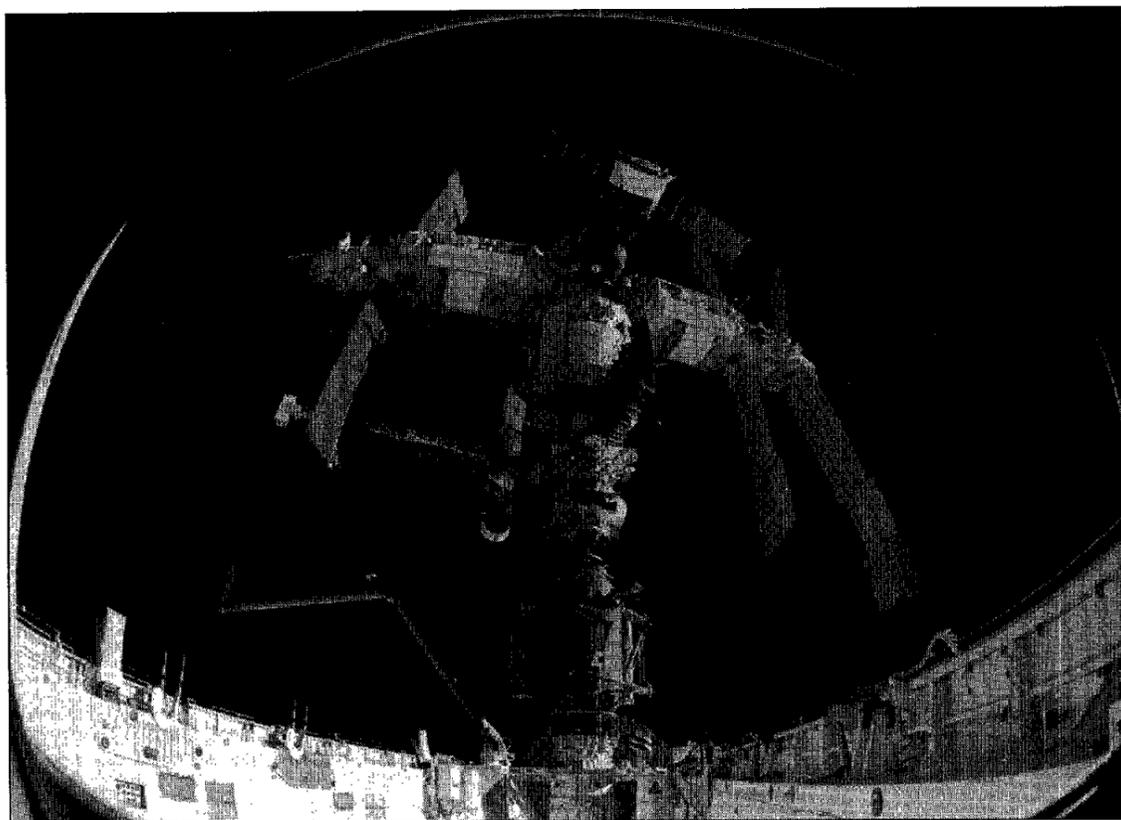
Treadmill, Lifestyler 8.0, 0 - 8 mph, 1.25 Hp DC motor, ex condition, \$350. Bob, x33149 or 488-7036.

Aluminum extension ladder, 20', \$50. 332-6178.

Stair climber, \$125. Shelley, x37824.

Ruger Blackhawk, .357 single action, 7 3/8" barrel, cleaning kit, soft case, 150 rounds ammo, ex condition, \$200 firm. 244-5375 or 286-0927.

Schwinn Air-Dyne w/gel seat, ex condition, \$225. Tracy x4



Phasing Future Foundations

Phase 1—a building block for space station technology

(Editor's note: This is the first in a series of articles on the Phase 1 Program. Profiles of astronauts slated for a stay on Mir will follow this overview as their flights approach.)

By Kyle Herring

The United States and Russia have just decided to lengthen the first of the three steps in an approach leading to the development and eventual staffing of a permanent International Space Station.

The longer stride for Phase 1 comes in the form of two additional shuttle-Mir docking missions to be flown in 1998 designed to expand the knowledge of life in space over extended periods.

With the launch in two weeks of the third shuttle docking to Russia's Mir Space Station, NASA and its international partners are finding that Phase 1 is a valuable precursor to learning about all aspects of living and working in low Earth orbit. Phase 1 now consists of nine missions in which the shuttle will link up to the Mir to deliver astronauts as well as logistical supplies and water.

Some of the Phase 1 mission activities that will lead to long-term benefits include rendezvous and proximity operations near a large space structure; the effects of thruster jet firings on those structures and how to minimize or redirect those firings; assembly techniques similar to those that will be used beginning next year on the ISS; and long-duration effects on the human body and how those effects can be studied to benefit people on Earth.

"We are laying the foundation for construction of the International Space Station with these docking flights," said NASA Administrator Daniel S. Goldin. "Mir is proving to be an ideal test site for vital engineering research and expanding our knowledge of the effects of long-duration weightlessness on people."

From a Space Shuttle Program standpoint, that foundation actually began three years ago when Russian Cosmonauts Sergei Krikalev and Vladimir Titov arrived at JSC to train for shuttle flights and to offer the expertise of veteran spacefarers who have lived and worked on long duration space missions aboard Russian space stations.

Krikalev flew on STS-60 in 1994 and Titov on STS-63 a year later. Titov and his crewmates performed a rendezvous with the Mir space station by flying within 37 feet of the laboratory while keeping a continuous verbal communications link with the cosmonauts on board the station.

As the STS-63 crew trained for that first Mir close approach by a shuttle, two veteran astronauts prepared to head to Star City, Russia—home of the cosmonauts. Norm Thagard and Bonnie Dunbar trained as prime and backup crew members for what would be a history-making flight for an American—a launch aboard another country's rocket and a



four-month stay on another country's space station.

Thagard's Mir-18 mission began with the launch aboard a Soyuz rocket with cosmonauts Vladimir Dezhurov and Gennady Strekalov a year ago. Following four months of life sciences research, space walks, station module reconfigurations and the arrival of a new Earth-studies laboratory module called Spektr, the crew returned to Earth aboard

Atlantis, concluding the longest space flight by an American and the first shuttle mission to dock with the Mir space station.

Atlantis' STS-71 flight included a crew exchange, dropping off two cosmonauts before returning home. The Mir-19 crew of Anatoly Solovyev and Nikolai Budarin began their mission from Florida aboard *Atlantis* and returned home to the plains of Kazakhstan aboard the Soyuz capsule left behind by the Mir-18 crew.

The building-block approach to the start of the assembly of the International Space Station next year continued with the launch of *Atlantis* in the fall of last year on the second docking mission to deliver a Russian-built permanent Docking Module to Mir. This fixture will be used for all future shuttle docking flights providing an extended attachment point for clearance for the shuttle without further reconfiguration of existing science modules on the station.

STS-74 proved the concept of assembling large space components in the microgravity environment of Earth and demonstrated the capability of the shuttle to serve as the cargo vehicle and construction platform for such assembly.

Atlantis has again been processed for launch and sits on Launch Pad 39B at the Kennedy Space Center for the upcoming STS-76 mission in two weeks to deliver the second American astronaut—Shannon Lucid—to Mir for a long-duration stay of about five months.

She will begin a continuous presence of U.S. astronauts aboard Mir for more than two years. Lucid has four previous flights under her belt—STS 51-G in 1985, STS-34 in 1989, STS-43 in 1991, and STS-58 in 1993.

Each subsequent shuttle flight to Mir will exchange U.S. crewmembers, dropping one off during the docked phase of the flight and bringing another home. Next to follow Lucid will be veteran shuttle Commander John Blaha on STS-79 in August. He and Lucid have trained together at Star City for more than a year.

Jerry Linenger will follow Blaha and Mike Foale will replace Linenger. Additional astronauts will be selected to work aboard the space station now that at least two additional flights have been added to Phase 1.

Their training activities are being overseen by a group of people located at Star City, currently headed by Astronaut Charlie Precourt who flew on the first docking mission and will command the sixth.

The two additional flights are STS-89, which had not been previously designated as a Mir mission, and a second mission—a new flight to Mir added to the shuttle manifest—STS-91.

"These additional flights allow more opportunities to refine the operational processes and relationships required by ISS," said Frank Culbertson, acting director of the Phase 1 program. "The flights also supplement the research opportunities during the earliest months of ISS assembly prior to delivery of the U.S. laboratory."

Culbertson added that the two missions will help reduce "the Mir logistics support burden on the Russian launch capability and potentially offload the logistics burden for ISS."

This first step toward the new International Space Station already has demonstrated the ability of the U.S. and Russia to take culturally diverse space programs down the same path. Joined by a

host of international colleagues from the European Space Agency, Canada and Japan, the knowledge base and expertise will continue to phase toward the future.

Phase 1 has provided not only the capability to conduct significant life sciences, rendezvous and assembly work, but to bridge those cultural differences and work together to solve technical problems for the benefit of the ISS program.

"Numerous technical design and operational issues have been uncovered and resolved," Culbertson said. "Learning about the process by which we have accomplished these significant activities is probably one of the most important potential contributions to the ISS program."

"But the most valuable current contribution of Phase 1 is the way it brings U.S. and Russian personnel together in multifaceted scenarios where they are required to work real issues to conclusion and keep the bureaucracy at bay," he added.

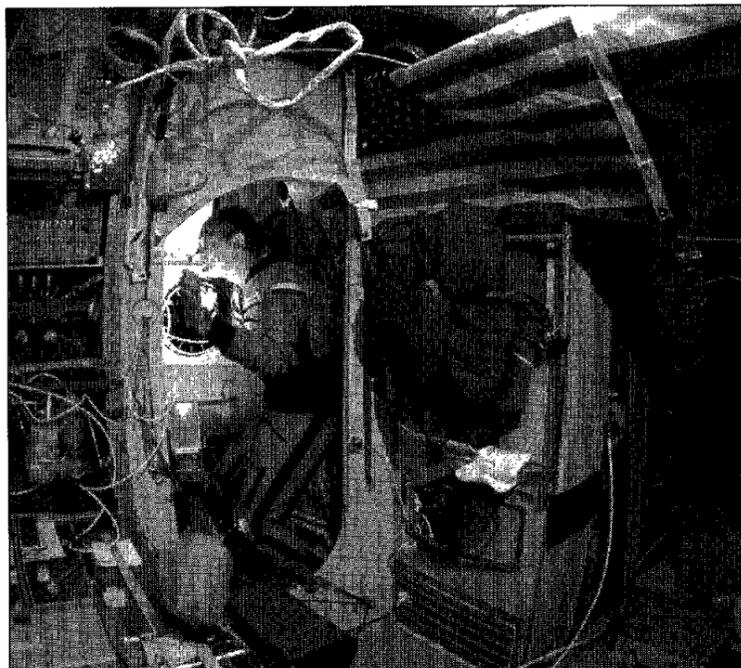
As dynamic as the ISS program is, decisions are being made and progress continues. Russia will modify its Soyuz space capsules to

accommodate a larger percentage of the U.S. astronaut corps since the capsule will serve as the emergency return vehicle for crew members living and working on the station through the end of its construction in June 2002. At that time, new NASA-developed vehicles are expected to be available. Size restrictions of the Soyuz capsule currently would prevent nearly half of all U.S. astronauts from being eligible for Russian-based launches to the station.

Russia also will increase the payload-carrying capability of its Progress resupply vehicle by 440 pounds, and will develop a new resupply vehicle, called the FGB cargo vehicle, which would haul maneuvering propellant to the space station.

Launch of the first component of the International Space Station is 20 months away. Astronaut Bill Shepherd and Krikalev will make up two thirds of the first team to occupy the International Space Station six months later. They will be launched aboard a Soyuz rocket from the Baikonur launch site in Kazakhstan.

The International Space Station team is at Phase 1 and counting. □



NASA Photos

From left to right, top to bottom: 1) A fish-eye view from the onboard IMAX cameras shows *Atlantis* completing its docking operations with the Russian Mir Space Station during STS-74. The astronauts successfully attached the docking module to Mir's Kristall module that will serve as the permanent docking port for future shuttle/Mir missions. 2) The first American to live and work on Mir, Cosmonaut/Researcher Norm Thagard, shows off his sleeping accommodations. 3) Oleg Babkov, senior program manager for RSA Energia cuts a Mir 10th anniversary cake in the Teague Auditorium. Babkov with Charlie Lundquist, left, deputy manager for the Launch Package Russian Segment Integrated Product Team One, celebrated the anniversary Feb. 20 during two weeks of technical interchange meetings held at JSC. The group sang 'Happy birthday to Mir' during the celebration. 4) STS-74 Commander Ken Cameron floats into the core module of Mir.

Galileo's Jupiter findings highlight 27th lunar conference

By Eileen Hawley

Images and data gathered during the Galileo spacecraft's investigation of Jupiter will be one of the highlights of the 27th annual Lunar and Planetary Science Conference to be held March 18-22 at the Gilruth Center.

Once again, international experts in the fields of meteorites, astronomy, lunar geology and geochemistry will meet for five days of presentations and discussions, including a special plenary session on Space Science Program featuring Associate Administrator for Space Science, Wesley Huntress.

Conference presentations begin at 8:30 a.m. March 18 with "Outer Planet Satellites;" "Ordinary Chondrites;" and "Martian Atmospheric and Fluvial Processes."

At 1:30 p.m. the Harold Masursky Lecture

will be given by Andy Ingersoll discussing "Probing Questions About Jupiter." Immediately before the lecture, the 1995 Stephen E. Dworkin Student Paper Award winners will be honored. The 2:30 p.m. presentations include: "Lunar Basins: Theory, Observations and Experiments;" "Stardust;" "Galileo Mission to Jupiter—Results from Encounter;" and "Reflectance Theory/Space Weathering Examples from the Moon."

Day two will begin at 8:30 a.m. March 19 with "The Lunar Highlands: Macro to Micro;" "CAIs and Carbonaceous Chondrites;" and "Mars: Volcanic, Tectonic Processes." At 1:30 p.m. "Mare Basalts: Generation, Emplacement, Composition, and Distribution;" "Comets and Asteroids;" "Metal-rich Meteorites;" and "Mars Deep Interior," will be discussed.

At 3 p.m. discussions will focus on "Planetary Interior Processes."

At 8:30 a.m. March 20 discussions will begin with "Remote Sensing of the Moon and Mercury;" "Shergottites: Crystallization, Weathering and Ejection;" "Terrestrial Impact Structures, Tektites and Spherules;" and "From Small to Smaller." At 1:30 p.m., Huntress will be joined by H. C. Brinton, T. V. Johnson, and A. F. Cheng for "NASA Space Science Program." Presentations include "Space Science Program" by Huntress; "Planetary Research and Analysis" by Brinton; "Galileo Mission" by Johnson; and "Near-Earth Asteroid Rendezvous" by Cheng. Presentations resume at 2:30 p.m. with "Mars: Mineral Spectroscopy and SNC Mineralogy;" "From Stars to Solar Nebula;" "Impact

Materials and Effects;" and "Newest Lunar Meteorites." At 3:45 p.m. discussion will focus on "Solar Protons and Rare Gases."

At 8:30 a.m. March 21, early morning topics include "Resurfacing and Tectonic History of Venus;" "Meteorites: Martian;" and "Impact Story-Mechanics, Atmospheres and World Destruction." At 1:30 p.m. "Venus Volcanism and Tectonism;" "Chondrules in Ordinary Chondrites;" and "K/T Impact and Impact Vaporization," will be discussed.

The final day of the conference highlights "Origins: From Stellar Death to Lunar Birth;" "Achondrites;" and "Future Planetary Missions: Explorations in Progress," at 8:30 a.m. March 22. In addition scientists will participate in poster sessions set for 6:30-9:30 p.m. March 19 and 21 at the Lunar and Planetary Institute.

Boeing sub earns award

Dynacs Engineering Corp., a small disadvantage business, has been selected as the Small Business Administration's 1995 Regional Subcontractor of the Year.

Dynacs, a subcontractor to Boeing Defense and Space Group, provides various system engineering support on the International Space Station for Russian hardware integration including, subsystem architecture, vehicle effectiveness and international partner coordination.

"Dynacs is a world-class leader among small businesses," said Doug Stone, Boeing Space Station's vice president. "They consistently provide superior engineering services and products while reducing costs."

Dynacs received NASA's Commitment to Excellence Award in 1995 and has been nominated as Boeing's Minority Contractor of the Year.

"We are very appreciative of the recognition," said Jayant Ramakrishnan, Dynacs Houston Operations director. "Our mission is to provide outstanding performance and customer satisfaction above and beyond the call of duty."

NASA renames x-ray explorer

NASA has named the X-ray Timing Explorer, placed into orbit in December 1995, in honor of a pioneer in the field of X-ray astronomy, Bruno Rossi.

The new official title of the 6,700-pound observatory is the Bruno Rossi X-ray Timing Explorer. The RXTE is currently in orbit and studying stellar black holes, neutron stars and quasars.

Professor Rossi and his colleagues discovered the first non-solar source of X-rays in a dramatic rocket flight in 1962. This source, Scorpius X-1, was the first of many collapsed stars that also are a key topic of study for the RXTE. Rossi was a pioneer in two separate fields of observational space astrophysics: X-ray astronomy and space plasma physics. He was the co-recipient of the prestigious Wolf Prize in Physics in 1987. The Bruno Rossi Prize, awarded annually by the American Astronomical Society to a top astrophysicist for achievements in the field, is named in his honor.

New chairman supports space station efforts

(Continued from page 1)

is a Congress that went from two years ago closely passing space station by one vote to 290 votes," Stockman agreed. "The same Congress and Jim's leadership put in a seven-year authorization in the House. Your roller coaster ride with the frustration, except for appropriations, is a thing of the past."

Sensenbrenner is expected to take over the chairmanship of the House committee when the current chairman retires.



HAMMER AWARD—Bob Stone, right, project director of the National Performance Review presents Vice President Al Gore's Hammer Award to from right Joe Fries, deputy manager of the White Sands Test Facilities, Jim Mager, deputy program manager for AlliedSignal at WSTF and Ben Boykin, AlliedSignal's program manager. The award was presented Monday to the WSTF team at the Quality in the Space and Defense Industry conference at South Shore Harbour Resort and Conference Center.

JSC photo by Benny Benevides

Career Plus+ briefing today in Bldg. 7A

Employees interested in teaching at the U.S. Naval Academy may be able to do so through the new Careers Plus+, Partners in Education Program.

All interested JSC civil servants are invited to attend a briefing by Professor Saarlus, chairman of the Naval Academy's Aerospace Department, at 1:30 p.m., today in Bldg. 7A, Rm. 141. Saarlus will provide a 20-30 minute overview of the Academy and will be available

to answer questions about teaching opportunities.

Participants who elect to participate in the Partners in Education program will: voluntarily retire from the civil service; be hired back as reemployed annuitants; and be paid for up to 1,040 hours per year for two years.

For more information about the program, contact the Human Resources Management Branch at x35266.

Scientists laud STS-76 crew work

(Continued from page 1)

to collect science that we ought to stay up here as long as we can to do the best work we can do," Allen said. "The microgravity payloads really benefit from having more time in space."

Researchers at the Rensselaer Polytechnic Institute in Troy, N.Y., including principle investigator Martin Glicksman, had the distinction of being the first university to send a command to an on-board experiment, the Isothermal Dendritic Growth Experiment, or IDGE, in *Columbia's* cargo bay. That step began a third science phase for the dendrites research team, to continue studying how metal alloys solidify free from the convective flows caused by Earth's gravity.

"This is the first time a principal investigator has commanded a microgravity science instrument on the space shuttle from his home institution—a U.S. college campus," United States Microgravity Payload Program Scientist Steve Davison, said Tuesday.

Throughout the mission, the Rensselaer Operations Control Center crew has been working hand-in-hand with its counterparts at the Marshall Space Flight Center to analyze data produced by the IDGE experiment. Now, with RPI in the driver's seat, the results of the first growth cycle became clear, as the first dendrite of this operational phase emerged in record time. The characteristics of these microscopic crystals help determine the strength and flexibility of products such as automobile engine blocks and jet engine turbine blades. The ultimate goal of the IDGE investigation is to improve ground-based materials processing for metals ranging from aluminum to steel.

Wednesday, the crew initiated a series of small thruster firings that put *Columbia* into a subtle 360-degree rotation to allow experimenters the opportunity to gather data into how movements such as these affect samples being grown in the quiet, stable environment of space.

Another collaborative effort is the Advanced Automated Directional Solidification Furnace investigation. AADSF brings together a sophisticated furnace for growing semiconductor materials and a science team under the direc-

tion of Principal Investigator Archie Fripp of Langley Research Center.

Three delicate lead-tin-telluride crystals were successfully grown by AADSF during this mission are slated for microscopic study when the samples return to Earth. Referring to the detailed science support, Fripp commented that his experiment performed "flawlessly."

"The pilot and crew put the shuttle in the proper attitudes required for sample processing and held them there," Fripp said.

Monday afternoon, the high-temperature AADSF furnace was cooled and prepared for landing today.

The Critical Fluid Light Scattering Experiment, known as Zeno, under the direction of Robert Gammon of the University of Maryland in College Park, the Zeno team includes members of Lewis Research Center and Ball Aerospace.

As his research team moves to within millionths of a degree of the point where the xenon sample will exist simultaneously as a liquid and a gas, known as the critical point, The basic science questions that the Zeno investigation seeks to answer could improve chemical engineering processes ranging from applying special paints to handling toxic waste.

The MEPHISTO investigation brings together nations working toward a common goal, with their French Space Agency center in Toulouse, France, and their NASA teams at Marshall and the University of Alabama in Huntsville all gathering data about crystal solidification.

"Most of the materials we use are formed by solidification," explained MEPHISTO principal investigator Jean-Jacques Favier. "This is true for semiconductors as well as high-strength alloys." The Information Age has linked people from around the world, and research conducted by the international MEPHISTO team could lead to faster computers and more versatile metals.

Landing was scheduled for 6:19 a.m. CST today at the Kennedy Space Center in Florida. *Columbia* flew over KSC Wednesday morning, allowing Allen and STS-76 Commander Kevin Chilton to talk while the *Atlantis* crew practiced its launch countdown at Launch Pad 39-B.

JSC employee ready to carry Olympic torch

Bill West of Rockwell International, who supports space station flight control in the Mission Operations Systems Division recently was selected to carry the Olympic torch the week of May 20 as it makes its way to Atlanta via the Houston area.

United Way selected 5,000 people nationwide to carry the torch for 1 kilometer. The local United Way filled 54 of those slots, including West. More than 10,000 people across the U. S. will have the opportunity to be part of the 1996 Summer Olympics.

West was nominated by Henry Lamaze, a Rockwell supervisor in the Space Flight Training Division, because of his many voluntary contributions.

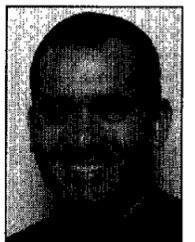
West was given an opportunity to fly a personal item on STS-60 and gave his slot to students at Smith Elementary School in Aurora, Ill.—West's hometown. The students were fingerprinted on a poster that flew on *Discovery* and West returned the flight item personally.

West also is a volunteer firefighter for Webster taking five to six calls a week after work hours. West noted that the majority of firefighting and emergency personnel throughout Texas are volunteer so he will dedicate his Olympic moment to those individuals.

"I feel honored to be chosen as one of the 54 to carry the torch in Houston, West said. "I will dedicate my one kilometer to all the firefighter and emergency response personnel in Texas."

West also volunteers his time in the national program HOST. He spent two hours a week last year at Pasadena Independent School District's Sparks Elementary helping third grade students to learn read.

Once the torch gets closer to Houston, West will have a firm time, date and location of his history-making opportunity.



West

Atlantis rolls to pad, work on schedule

(Continued from page 1)

Godwin or Clifford should they become detached from their tethers.

"We don't anticipate any problems with the EVA," Godwin said. "We have had some good training in Houston. For both Rich and myself, it's our first time out doing a real EVA so we expect a little orientation time getting used to the lack of water drag that we have in the water tank."

Atlantis was rolled to Launch Pad 39B on Feb. 28 in preparation for launch. Work is on schedule as engineers have completed installation and established electrical connections of the Spacehab payload in *Atlantis'* cargo bay. Main engine flight readiness tests were completed last week and engineers were conducting the helium signature leak test at mid-week.

Mission managers conducted a launch readiness review Wednesday and are expected to establish a firm launch date Monday in the Flight Readiness Review. Engineers at Marshall Space Flight Center are inspecting the STS-75 solid rocket motor nozzle-case joints after gas paths were discovered through wiper O-rings on both motors. Shuttle managers will review the inspection results before deciding whether there are any implications for the STS-76 launch.

Other briefings, including the crew news conference will be conducted Tuesday. A Phase 1 briefing with Frank Culbertson, acting director of the Phase 1 Program, Valery Ryumin, Phase 1 director of RSC Energia and John Uri, Mir 21 mission scientist will be held at 8 a. m.; a Mission Overview with Lead Flight Director Phil Engelauf will take place at 9 a.m.; the role of the Spacehab will be discussed at 10 a.m.; a space walk briefing will be held at 11:30 a.m. and scientists at NASA's Jet Propulsion Laboratory will discuss the KidSat payload at 12:30 p.m. The crew preflight news conference at 1 p.m. will round out the day's events.

Correction

The March 1 issue of the Space News Roundup incorrectly reported that Astronaut Brian Duffy had been named associate director for the center. Duffy has been named assistant director.