



Space News Roundup

Vol. 33

March 11, 1994

No. 10

Flight tests new concept

The Office of Safety and Mission Assurance will use a Pegasus launch vehicle to obtain valuable data from a flight test of a new laser-diode initiated ordnance system.

Launch is slated to occur in June from the Vandenberg Air Force Base in California. The system is essential to OSMA's goal of using faster, better and cheaper systems in space and aeronautic systems.

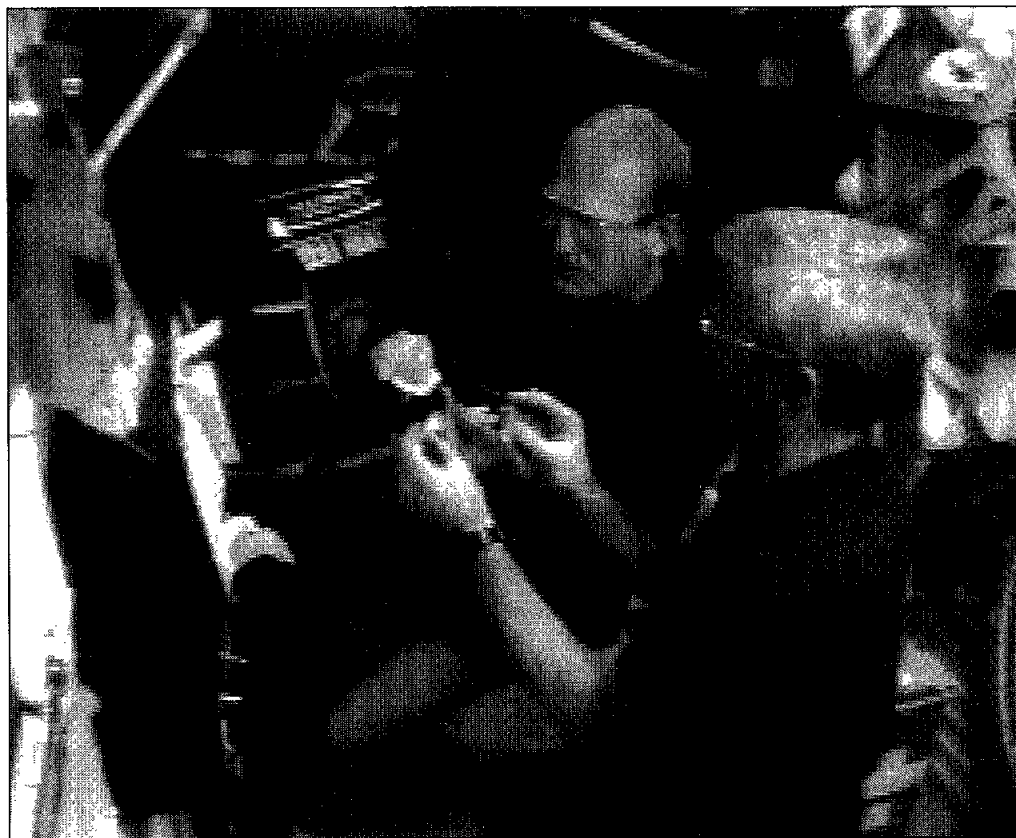
"A successful test of the system will allow future spacecraft to perform operations more efficiently and safely," said Fred Gregory, associate administrator for OSMA. The system is part of OSMA's Laser Initiated Ordnance System Validation Program and until now the absence of operational experience and critical test data was the major hurdle preventing the use of the system for future NASA activities.

The system can be used for a variety of pyrotechnic applications such as escape systems, spacecraft separation devices and flight termination systems. Currently, both NASA and industry rely on electric current to activate these mechanisms which require many safeguards to avoid the accidental firing of the initiators.

Under the planned concept, the laser initiated system may replace electrical bridgewire initiation systems reducing hazards from electromagnetic interference and the development of systems with no moving parts to increase reliability of electrical systems.

"The safety record using electric current is excellent because there are many elaborate safeguards designed to avoid accidental ignition," said Norm Schulz, manager of Safety, Reliability and Quality Assurance Technologies. "However, the laser initiated ordnance will improve design, testing and operations to achieve an even higher level of safety."

"Government and industry will work as a team to test and conduct the flight demonstration of the system," Schulz said. "Industry will be able to market the product and NASA would have demonstrated the system's technical feasibility, safety and the potential for cost savings on future spacecraft and aeronautical systems."



STS-62 Mission Commander John Casper prepares to draw blood from Mission Specialist Sam Gemar for one of the physiological studies on the effects of space flight on the human body. The crew is currently in Flight Day 8 of a planned 14-day mission studying materials processing in space and the physiological effects of flight.

NASA Photo

Crew works on research experiments

By Kelly Humphries

The crew of *Columbia* passes the halfway mark of its two week microgravity research mission today, with a host of materials processing and space technology experiments behind it and more ahead.

Columbia began its 16th mission last Friday with an on-time launch at 7:53 a.m. CST. Mission managers put off the launch by a day to allow stormy weather to pass through the Kennedy Space Center area.

All systems aboard the oldest space shuttle in the fleet were working well, and the astronauts onboard—Commander John Casper, Pilot Andy Allen and Mission Specialists Sam Gemar, Marsha Ivins and Pierre Thuot—appeared to be in good health and spirits.

The only problem of any significance involved some off-the-scale readings in an auxiliary power unit fuel line. Three APUs provide hydraulic pressure to swivel the shuttle's engines during launch and move its flight con-

Please see **RESEARCH**, page 4



Robotics experts to share technology at conference

A conference on "Intelligent Robotics in Field, Factory, Service, and Space" sponsored jointly by JSC and the American Institute of Aeronautics & Astronautics begins March 21 at South Shore Harbour Resort and Conference Center.

The theme of the three-day conference, "Sharing Technology in the National Interest," promotes President Clinton's initiative to build economic strength by developing

closer relationships between government and industry. The conference is planned to attract buyers, users, manufacturers, integrators, and developers of intelligent robotics with the goal of sharing information and forming new relationships.

"We're reaching out to try to find the commonality of approach and application between disciplines," said Jon Erickson, chief scientist of

the Automation and Robotics Division. "We're sharing technology, information and common elements across technological communities in the hopes that there is additional understanding and insight that will come out of this and benefit our positions in the globally-competitive markets of today."

Conference topics include robotics uses in health care, manufacturing, environmental applications, security

monitoring, nuclear industry, space applications, military applications, and robotic manufacturing. Sessions on robotic sensing, vision, and perception are included in the conference program.

A reception and banquet featuring a keynote address by Joseph Engelberger is planned for 6:30 p.m. March 22. For registration or additional information, contact Mary Stewart, ext. 31724.

Experts to discuss planets and cosmos at Gilruth

JSC will play host to many of the world's top scientists at the 25th Annual Lunar and Planetary Science Conference slated to begin March 14 at the Gilruth Center.

Scientists will discuss the latest research findings about the planets and the cosmos at the conference which begins at 8:30 a.m. March 14 and runs through March 18. "At this year's conference, we will celebrate the 25th anniversary of the

first manned visit to the Moon," said Doug Blanchard, chief of the Solar System Exploration Division. "While we will discuss ongoing lunar and planetary research, we will emphasize what we are learning about the universe now and how that influences future exploration."

A presentation entitled "Things That Go Bump in the Night: Shoemaker-Levy 9," will provide the

latest information on the comet's collision course with Jupiter. Fragments of the shattered comet are expected to strike the planet in July. Also, video of the Moon's surface taken by the recently-launched Clementine spacecraft will be shown during the conference.

Presentations slated for the opening day include: Venus-Gravity and Interior Processes; Origins of Planetary Systems; and Asteroidal

and Planetary Basalts, all beginning at 8:30 a.m. Afternoon sessions begin at 1:30 p.m. with presentations on Venus Tectonism, Lunar Geology and Global Evolution, and Refractory Inclusions. The day concludes with a 5 p.m. reception at the Gilruth Center to honor the winners of the 1993 Stephen E. Dworkin Student Paper Award and the 1993 G. K. Gilbert Award Winner.

Please see **COSMIC**, page 4

Engineers take expertise to schools Fund transfer eliminates furlough threat at NASA

By Eileen Hawley

In the past month, more than 150 JSC engineers returned to the classroom to discuss engineering disciplines and lessons.

But these engineers did not return as students seeking advanced degrees. Instead, they were sharing the lessons they learned working at JSC with students from grades 1 through 12 as part of National Engineers Week.

Officially, National Engineers Week ran Feb. 20-26, but the JSC program extends beyond the formal one week observance and is just ending the final week of a three-week program to encourage students to pursue careers in engineering.

"The response we get from our engineers is very gratifying," said JSC Public Affairs Specialist, Norma Rhoads, "Every year, schools request someone to talk about engineering disciplines and the importance of math and science in these

careers. Without the support of our engineering community on site, we would not be able to support these requests."

On a typical visit to a school, the engineer prepares a lesson on some aspect of engineering and teaches it to the class. By showing children the application of engineering to real-world challenges in a hands-on environment, these JSC engineers share the excitement of discovery and exploration while demonstrating the practical uses of mathematics and science. Visits normally last about one hour and include a question and answer session.

But supporting the school outreach effort requires more than just the one-hour of class time. Many engineers visit a number of classes and spend additional time developing a lesson plan. Jessica Kite, an engineer working on space station operations in the Mission Operations Directorate, developed a les-

son plan which required her students to build a space station. "With the younger children, you want to focus on team building and how to make science and math relate to the real world in a fun way," Kite said.

Kite created space station elements from colored paper and divided the class into teams of five children. "We built space stations," Kite said. "Each one of the kids was responsible for some element, such as the truss, solar arrays, lab modules, antennae, or acting as manager for the team." The goal of Kite's exercise was to impress on the children that a key portion of engineering relies on learning to work together and learning to ask the right questions to resolve conflicts. "The thing you want to send the younger kids away with is the idea that playing on a team is important and that everyone on the team is important. And you want to remind them to always challenge, always ask 'why?'"

Please see **ENGINEERING**, page 4

The possibility of JSC employees being furloughed to cover projected funding shortfalls in the NASA budget has been eliminated with the passage of a supplemental appropriations bill by Congress.

The bill effectively transferred funds from other accounts to the Agency Resource and Program Management fund source 1 account which covers basic salary and benefit costs of NASA employees, according to Harvey Hartman, director of Human Resources.

As a result of the transfer of \$56 million dollars agency wide, NASA will be able to meet its payroll for the rest of the year, including the locality pay increase implemented in January. Effective March 6, JSC organizations were released to resume normal promotion programs up through grade 13 for those employees otherwise due for promotion since October. "We are

very pleased to be able to restart our normal promotion program," said Hartman. "This is the best possible news, particularly for our outstanding employees in career ladders."

The reprogramming of funds also means that the popular "Go-the-Extra-Mile" incentive award program will be available. Fund guidelines for restarting the program are being distributed to JSC organizations. Additional funds will be available for employee training although some controls will continue.

Some other restrictions will remain in place at least until the proposed buy-out legislation is resolved. NASA and Government wide buy-out legislation remains locked in conference committee. Until the buy-out issue is resolved, restrictions on hiring from outside the center will remain frozen as will promotions to grade 14 or above.

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.

Moody Gardens — Discount tickets for two of three different attractions: \$9 Entertainment '94 Coupon Books — Bay Area/Galveston/Downtown or FM 1960/Downtown: \$30 each, \$1 off first book for civil servants. Gold C Books: \$8 Space Center Houston — Discount tickets: adult, \$7.50; child (3-11), \$4.50; commemorative, \$9.95.
Metro tickets — Passes, books and single tickets available.
Movie discounts — General Cinema, \$4.50; AMC Theater, \$3.75; Loew's Theater, \$4. Stamps: Book of 20, \$5.80

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 6:30-9 p.m. Monday-Friday; 9-11 a.m., 1-3 p.m. and 6:30-9 p.m. Wednesdays; and 8 a.m.-4 p.m. Saturdays. Dependents must be between 16 and 23 years old.

Ballroom dancing — Classes meet from 7:30-9 p.m. Thursday nights. Cost is \$60 per couple for eight weeks. Beginner, beginner-intermediate, intermediate and advanced instruction is provided. Classes are on-going.

Weight safety — Required course for employees wishing to use the weight room is offered from 8-9:30 p.m. March 22. Pre-registration is required. Cost is \$5.

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

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

Creative writing — Five-week basic creative writing class meets from 6:30-9 p.m. beginning March 31. For additional information, contact Barbara Reeves, 473-0748.

Aerobics — High/low-impact class meets from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is \$32 for eight weeks.

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

Aikido — Martial arts class meets from 5-7:30 p.m. Tuesdays and 6:15-8:15 p.m. Wednesdays. Black Belt class from 6-8 p.m. Fridays, requires instructor permission. Cost is \$25 per month.

Softball tournament — Men's Open C pre-season softball tournament will be held March 26-27. Registration deadline is 7 p.m. March 24. Cost is \$100.

Stamp club — JSC Stamp Club will meet from 7-9 p.m. every other Monday. For more information, call Dianne Kerkhove at 554-2764

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

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Dates & Data

Today

Cafeteria menu — Special: meat sauce and spaghetti. Total Health: spaghetti noodles with turkey meat sauce. Entrees: rainbow trout, liver and onions, been cannelloni, pork and shrimp egg roll, Reuben sandwich. Soup: seafood gumbo. Vegetables: steamed broccoli, breaded okra, cut corn, black-eyed peas.

Saturday

LPI lectures — The Lunar Planetary Institute public lecture series continues with Dr. Eugene Shoemaker discussing "Cosmic Bullets, Craters and Catastrophes" at 7 p.m. March 12 at the University of Houston Clear Lake's Bayou Theater.

Monday

Cafeteria menu — Special: turkey and dressing. Total Health: herb flavored steamed pollock. Entrees: breaded veal cutlet, beef chop suey, steamed pollock, beef cannelloni, French dip sandwich. Soup: beef and barley. Vegetables: Brussels sprouts, mixed vegetables, egg plant casserole, winter blend vegetables.

Tuesday

Cafeteria menu — Special: pepper steak. Total Health: barbecue chicken. Entrees: baked lasagna, pork chop and fried rice, turkey a la king, baked chicken, French dip sandwich. Soup: black bean and rice. Vegetables: breaded squash, steamed spinach, baby carrots, navy beans.

Wednesday

Astronomy seminar — The JSC Astronomy Seminar will meet at noon March 16 in Bldg. 31, Rm. 129.

Jim Oberg will speak on "Buying Moon Rocks and other Space Auction Stories." For more information, call Al Jackson, 333-7679.

Cafeteria menu — Special: Mexican dinner. Total Health: steamed pollock. Entrees: broccoli cheese quiche, catfish and hush puppies, spare ribs and sauerkraut, steamed fish, Reuben sandwich. Soup: seafood gumbo. Vegetables: Spanish rice, pinto beans, peas, broccoli.

Thursday

NCMA Seminar — The Space City-Houston Chapter of the National Contract Managers Association presents an educational seminar on "Commercial, Environment and International Contracting: An Evolving Focus," at 8:15 a.m. March 17 at the University of Houston-Clear Lake. Cost is \$135 for members and \$185 for non-members. Registration deadline is March 7. For additional information, contact Jennifer Reynolds, 438-4621.

IEEE Symposium — The JSC Chapter of the Institute of Electrical and Electronics Engineers will co-sponsor the Joint Applications in Instrumentation Process and Computer Control symposium beginning at 8:30 a.m. March 17 at the University of Houston-Clear Lake. Cost is \$20. For registration and information, contact Vernon Bryant, 283-3770 or Ken Goodwin, x38244.

Russian speakers — Practice Russian language skills from 11 a.m.-1 p.m. March 17 in the Bldg. 3 cafeteria. For more information, call Jack Bacon, x38725, or Amy Mendez, x38066.

Cafeteria menu — Special: hamburger steak with onion gravy. Total Health: spicy new potatoes. Entrees: corned beef, cabbage and new potatoes, chicken and dumplings, meat ravioli, French dip sandwich. Soup: broccoli cheese and rice. Vegetables: navy beans, cabbage, cauliflower, green beans.

Friday

Cafeteria menu — Special: tuna noodle casserole. Total Health: broiled chicken breast. Entrees: deviled crabs, broiled pollock, liver and onions, broiled chicken with peach half, Reuben sandwich. Soup: seafood gumbo. Vegetables: Italian green beans, cauliflower au gratin, steamed rice, vegetable sticks.

March 21

AIAA conference — JSC and the American Institute of Aeronautics and Astronautics will co-sponsor CIRFFSS '94 beginning at 9 a.m. March 21 at South Shore Harbor Resort and Conference Center. The theme of the four-day conference is "Sharing Technology in the National Interest." For additional information, call (202) 647-7463.

March 23

Astronomy seminar — The JSC Astronomy Seminar will meet at noon March 23 in Bldg. 31, Rm. 129. For more information, call Al Jackson, 333-7679.

Freedom fighters — The Space Station Freedom Fighters will meet at noon and 5 p.m. at the Freeman Memorial Library, 16602 Diana. For more information, contact David Cochran, 482-7005.

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

Rent: Arkansas cottage, Blue Mt Lake, furn, 4 ac, \$250/wkly/\$50/dly. x33005 or 334-7531.

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

Sale: Galveston beach house, 3-2, CA/CH, furn. Ed, X37686 or 326-4795.

Sale: TaylorCrest, 4-3-2.5D, 3200 sq ft, pool/spa, cul-de-sac, 4% to buyer's agent, \$282.5k. Richard, x30271 or 326-4963.

Sale: Clear Lake Shores, 3-1, located in water front community. 538-1849.

Rent: Heritage Park, 3-2-2, FPL, ceiling fans, \$795/mo. 334-4301.

Sale: Oakbrook West, 4-2-2, ceiling fans, FPL, lg yd, \$99.5k. Denise, x31846 or 486-5146.

Sale: Pearland/Nottingham, 3-2.5-3D, lg 2-story, energy effi, 2 FPL's, formal dining, study. 485-2079.

Sale/Lease: Friendswood, 3-2-3, corner, FML LR & DR, lg den, cnr gas FPL. Gary x31059 or 480-9716.

Cars & Trucks

'82 Dodge Stakebed, DOT inspected, sideboards, \$5k OBO. 485-7274 or 639-3138.

'80 F100 Ford truck, 302, auto, swb, good cond, \$2.5k. 337-6394.

'80 Olds Cutlass Supreme, wht, 4 dr, AC, PS/PB auto, 129k mi, \$950. Riley, x37752 or 280-9424.

'90 Toyota Tercel, red, atuo, A/C, 54k mi, ex cond, \$4.990. x36781 or 486-0361.

'86 Hyundai Excel, 4 dr, 5 spd, A/C, AM/FM/cass, 70k mi, \$1.3k. Denise, x31846 or 486-5146.

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

'86 Nissan 300 ZX turbo, auto, blk, T-tops, AM/FM/cass, A/C, ex cond. 996-7716.

'83 Ford Custom van, 108k mi, AT/OD, AC, AM/FM/CB, \$2.2k. John, x36486 or 488-2276.

'89 Mercury XR4T, 2.3 turbo, 5 spd, pwr windows, sun roof, ex cond, \$6.2k OBO. x34599 or 559-2716.

'86 Pontiac Grand AM, 4 dr, auto, A/C,

87k mi, \$2k OBO. 486-0191.

'85 Chevy PU, Silverado short bed, AT/PS/PB, AM/FM, A/C, 47k mi, \$5.5k. Bob, x37246 or 326-1510.

'90 Geo Metro, 5 spd, A/C, 44k mi, ex cond, \$3175. Dave, x33729 or 335-1645.

'89 Ford Aerostar Minivan, A/C, all pwr, ex cond, \$9250. 980-7481.

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

'85 Chrysler New York, auto, gunmetal blue, ex cond, 96k mi, computer, \$2.3k OBO. 333-6713 or 486-1907.

'87 Pontiac 6000 STE, auto, V6, ex cond, 53k mi, \$5495 OBO. Steve, 783-5386.

'87 Skylark, loaded, \$1.9. Mary, 991-7247.

Boats & Planes

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

Shrimp boat, 10 x 25, nets, drs, radio & trailer. Mary, 991-7247.

22.5' Sea Ray Cuddy cruiser, 228 Hp merc, New Alpha One I/O, 6" color Furuno depth finder, VHF, ex cond, \$8.5k. Mark, x38013 or 992-4132.

18' VIP Vision, 130 hp/OMC/I/O. access, ex cond, \$9.9k OBO. Jennifer, x38668 or 286-0507.

Chaparral 187, 140 HP Mercruiser I/O, SS prop, electronics, ex cond, \$5.7k. x37954 or 481-1605.

'90 Hunter 30' aux sloop, A/C, Roller Furline, digital knot/depth/wind, autopilot, Bimini, ex cond, \$52.5k. 980-7481

Cycles

'81 Honda SL 125 motorcycle, 2.3k mi, dirt bike/street legal, \$500. Joan, 479-3572.

'80 Honda 750 Custom motorcycle, does not run, \$300 OBO. Vincent, x34088 or 333-9739.

Childrens Suzuki Quad racer, new \$140, sell \$60 firm. 282-2731 or 331-0164.

'80 Honda CM 400T motorcycle, 3k mi, \$850. Ron, x31959 or 482-5952.

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

Boy's 27", 10 spd, \$30. Debbie, x36034 or 332-5709.

Audiovisual Computers

Magnavox Video writer integrated word processor/printer, needs work, \$35 OBO. Musgrove, x38356 or 488-3966.

'93 Sega Genesis w/2 controllers or will trade for super Nintendo. Becky, x36530.

Seiko 14" color monitor 1,024 x 768 DP Trident 1 MB graphics card 1,024 x 768, \$200 both. x34658 or 484-5712.

Yamaha T-760 stereo tuner, ex cond, w/memory for 5 AM/FM stations, \$150 OBO. x32944.

MS-Excel for Windows 4.0, \$35; MS-

Word for Windows 2.0, \$35. 992-1466.

Toshiba T5200, 386SX at 20 MHz, 6 MB of RAM, 200 MB HD, 2 serial/1parallel, 1 RGB port for ext monitor, ex cond, \$750 OBO. Tran, 777-7003.

NEC-286 computer, 640k RAM, 44M HD, 2 floppy drives, color monitor, kybrd, software, \$600. Earl Rubenstein, 480-1998.

Commodore 64C, COMM 1541 DD, Sears SR 2000 dual interface dot matrix printer, \$50 ea or \$150 all. Dave, x34983 or 474-5363.

IBM P/S model 50-286 VGA monitor, ext drive, mouse, windows 3.1, DOS 6.2, \$375. Brandon, 282-4587 or 554-4799.

Photographic

Nikon FM body, 24 mm/2.8, 50 mm/2.0, 43-86 mm/3.5, 135 mm/3.5, 200 mm/4.0, 500 mm Reflex/8.0, flash extension tubes, tripod; Nikon TC16A auto focus 1.6 teleconverter. x30419 or 486-5222.

RCA Pro 8 video camera, access, \$450 OBO. 482-6879.

Cannon A1-E flash, case, lens, \$200. 282-6756 or 326-3137.

Musical Instruments

Yamaha kybrd w/80 watt amplifier, \$200 firm. x39034 or 474-2660.

Pets & Livestock

AKC reg Boston terrier puppies, 3 female, 4 male, Feb-2-94. Mike, 489-4558 or 639-3138.

AKC reg Siberian Husky, female, blk/wht, \$150 OBO. 991-5280.

Yorkie/Silky terrier puppies, born Feb 2, avail, 3/12, \$75. Karen, 479-8297.

EMU chicks & 5 yr old female. 482-0874.

Lost & Found

Lost keys at Gilruth Center, Black & Decker tape measure keychain. Chris, x38956 or 335-0373.

Household

Small couch and wicker chair, \$50 both. Steven, x47207.

Sleeper sofa w/matching loveseat, off-wht w/earth tones, \$300; trundle bed, \$100; Panasonic rack stereo w/spkrs, \$200. Todd, x33736 or 334-5621.

Waterbed kg sz, mirrored headboard, lighted cabinets, semi-motionless matt, ex cond, \$200 OBO. Sharon, x33019 or 554-6741.

Couch & loveseat w/recliners, grey, \$250 ea; blk lacquer coffee tbl & end tbl, \$25 ea. x30636 or 992-2186.

Full sz bed, mattress/box springs/frame/headboard, ex cond, \$120 OBO. Barry, x38410.

Solid wood coffee table, dk finish, 20" x 56", \$20. Jan, x33022 or 992-3522.

Full sz hvy duty Hotpoint elec W/D set,

ex cond, \$450 OBO. x38079.

Full sz waterbed matt w/box support, \$50; couch, \$50; antique oak end tbl, \$40; assorted bookcases, \$10 - \$15; lg antique dresser, \$100; tall book-case/entertain center, \$35; microwave stand, \$25. Ann, 486-9662.

Couch, 6 ft, brown/orange, non-smoker, \$125. Tom, 996-5835.

Early American coffee tbl, step design w/dwr, \$40. William, x30467 or 532-1994.

Bassett, solid wood book shelves/entertainment center, \$200 - \$500/unit. 869-5557.

Dining table & six chrs, \$350. 992-1466.

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

Wanted

Wanted riders for Van Pool, West Loop park and ride to NASA/contractors. Richard, x37557.

Wanted person to rent 2 rooms, in Clear Lake area, 3-2-2, owner occupies Mas BDRM, \$400/mo for one person + 2/3 util. 286-7516.

Wanted non-smoking roommate, 2-2-2 house Piper's Meadow, no pets, \$300/mo + 1/2 util. Tracy, x47120 or 486-46.

Wanted Wake Shield Facility, Bremsat & Oderacs Payload patches from STS-60, will buy or trade. Andrew, 280-0647.

Wanted motorized treadmill w/incline capabilities, 486-7940.

Wanted non-smoking housemate, share 3-2-2, Bay Glen/CLC, \$300/mo + \$200 dep, +1/2 util. Larry, x33168 or 488-7460.

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

Wanted female/male, non-smoking, no pets, share furn house Harborview /LC, \$300/mo +1/2 util. Ian, x34853.

Wanted female roommate to share 3 bdrm house, Landing/LC, \$300/mo + 1/2 util. Cathy, x41267 or 554-4579.

Wanted car pool from SW 59 Fwy W. Belfort HOV parking lot to JSC. 480-4349.

Miscellaneous

Liquidating collection, 50 plate "Collectables" various artists, \$15 ea or 2 for \$25. Earl Rubenstein, 480-1998.

Yonex ADX 100 driver clone, Graphite shaft & head, ex cond, \$75. Bob, x33149.

Pres & First Lady Charter Gold membership, \$450; Black & Decker space-maker coffeemaker w/timer, \$10. Rich Delgado, x47257 or 996-7630.

30" riding lawn mower, 11 hp, 8 spds, ex cond, \$575. Mark, x38013 or 992-4132.

Hubble Space telescope mural by R. McCall, framed, ex cond, \$150 OBO. Steve, 778-1598.

Tunturi exercise Air bike w/electronic

monitor speed/time/distance/heart rate, \$225 OBO. x38079.

Champion Stainless steel juicer, \$200 OBO. Rick, x48842 or 538-4278.

Sears hen egg-laying nesting box-10 compart, ex cond, \$45; portable galvanized steel fence, 7 sect ea 42" x 48"; telescope w/folding tripod, new \$850, sell \$450. Jim, x39229 or 482-7873.

Raichle RX860 men's ski boots, sz 9 1/2, \$60. Jeri, 333-7552.

Marina Village membership on Lake Livingston, 24 hr security, golf, boating fishing, \$1.5k. Joan, 479-3572.

Two empty 25 gal propane tanks, new \$125 ea, sell \$60 ea firm. 282-2731 or 331-0164.

Rare Apollo 10 & 16 Beta cloth space suit patches, ex cond. Andrew, 280-0647.

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

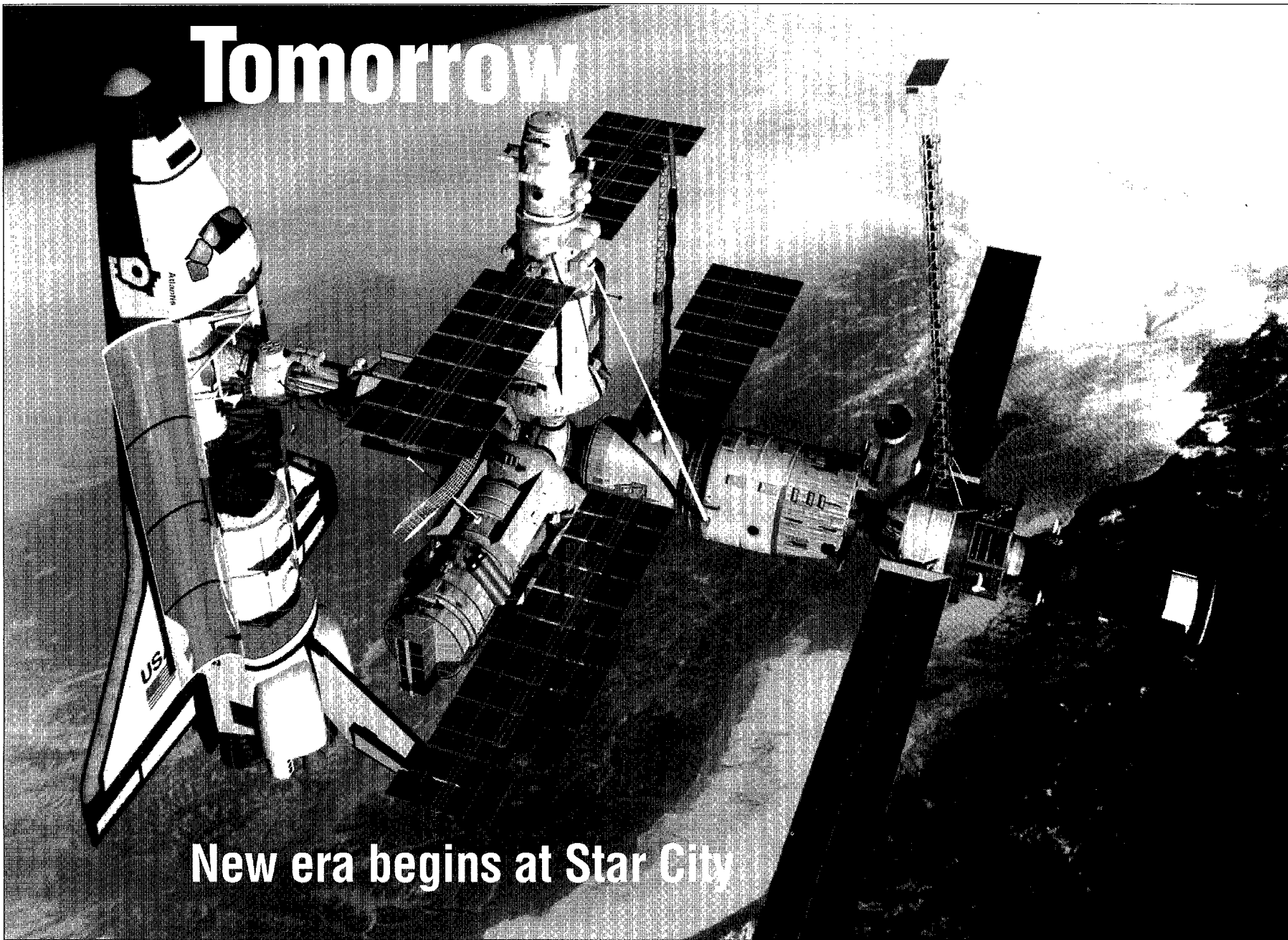
Two Jane Fonda Step Aerobics step & tapes, \$30 ea. 282-3215 or 480-9448.

King sz waterbed; Go-Cart. Mary, 991-7247.

Spkrs, 140 watts ea, \$75/pr; Black & Decker weedeater, \$25; Sears weed-eater, \$50; Murray lawnmower, \$120; fish tank & access, \$55; bike, \$35; Reel mower, \$50; Prince tennis racket, \$10. Bob, x30072 or 286-2011.

Crib 'N' Bed baby crib, 5 drws, wood finish, \$250. x34599 or 559-2716.

Two North West Airlines travel voucher exp 4/29/94, \$200 OBO. Ian, x34853.



Tomorrow

New era begins at Star City

By Rob Navias and Eileen Hawley

Astronauts Norm Thagard and Bonnie Dunbar arrived in Russia on Feb. 24 heralding the start of a new era in U.S./Russian space cooperation.

The two shuttle veterans are beginning a year of intensive training at the Russian cosmonaut training center in Star City as primary and back-up crew members for the launch of the Mir 18 flight, currently targeted for March 1, 1995. Thagard is a member of the primary crew, with Dunbar a member of the backup flight team that will fly only if the primary crew is grounded.

Following his historic launch on board a Soyuz spacecraft, Thagard will spend three months working with his crew mates on the Russian space station Mir. He will operate a program consisting primarily of American experiments designed to



'To be the first American to fly a Russian mission, to actually train with the crew and fly on a Russian craft, had tremendous appeal for me.'

—Norm Thagard

gather physiological data on humans in long-duration space flight as well as some experiments focusing on materials science. In the process, he will garner the most space-flight hours for any American astronaut in the history of the U.S. human space flight program.

"To me it's a great adventure," Thagard said. "I always thought it would be really great to fly in the Russian program, or what was then the Soviet Program, I always wanted this opportunity." For Dunbar, the possibility of participating as a crew member on this particular flight is remote, but she is enthusiastic about the opportunities her role as a backup crew member presents.

"I'm happy enough backing Norm up on this flight," Dunbar said. "I'll be going through the same training and experience

of learning the language, seeing the hardware and being able to look at their operational program and then being able to share that information with our own community. I think it will be very rewarding."

Before any of this happens, however, both astronauts anticipate some challenges as they learn about the Russian space program and the country they will call home for the next year. "My impression is the Russians have gone out of their way to make things ready for us," Thagard said.

"And after all, work is work. Whether we're training here or there — it's still training."

Both Thagard and Dunbar anticipate only minimal difficulties overcoming the language barrier. "I think after a short period of time, we'll accommodate very well," Thagard said. "Again, we're doing the sort of work we're used to doing, so the cultural impact may not play as big a

role as it might otherwise." Dunbar agrees that the biggest challenges are not necessarily cultural.

"Technically, questions like how do we do engineering, how do we do management, how do you present your data - do our systems work together? Those are the types of challenges we will have to work to resolve," Dunbar said.

Foremost among the differences Thagard expects to encounter is in the nature of training for the mission. "By definition the training has to be different, because with a one- or two-week shuttle mission we can virtually rehearse every aspect of the mission. You can't do that when you're talking about a three-month program." He does not believe this difference reflects a philosophical separation between Russian and American

programs, but rather is a fundamental training for a shuttle flight of a few weeks duration and a space station flight of months duration.

Both astronauts expect to receive full training and to be treated like their Russian counterparts. Although the former Soviet program launched the first woman in space, Russian crews do not routinely include female cosmonauts. "I believe I will be treated like any other crew member and not have the focus be on the fact that I'm a woman," Dunbar said. "My goal is to maintain the pride of our program, and participate as a full crew member."

Although intensive language study and a basic understanding of the Russian program helped prepare Thagard and Dunbar for their time at Star City, there is no way to train for a one-year separation from friends and family. Thagard expects

his wife, Kirby, and youngest son Danny, to visit Star City in June and perhaps even to stay if schooling arrangements for Danny can be worked out. Dunbar, whose husband Ron Sega recently flew with cosmonaut Sergei Krikalev on STS-60, realizes it may be difficult to coordinate their demanding schedules.

"Depending on program demands, Ron may be part of the astronaut contingent that cycles through Star City," Dunbar said, "or hopefully we'll see each other during planned technical visits in Houston." Dunbar says that compared to the long-term separations experienced by many active-duty military families, her tour at Star City will be easy.

While both agree that living and working in another country may be difficult at times, they remain enthusiastic about the roles

they are playing in the budding era of international space cooperation. "For a number of years some people have said that things like planetary exploration could only be done internationally, primarily because of cost," Thagard said. "There is no question that technically the United States could do what it wanted to do, but it may well be that we're at the point that we must do these things cooperatively and internationally in order to afford to do them."

Thagard is pragmatic about his involvement in the historic mission that will bring together two former space-race rivals in the first of many ventures planned for the future. "I don't think about the mission in terms of its historical significance," Thagard said. "It's the uniqueness that appeals to me." Back-up crew member Bonnie Dunbar hopes that "history will record this as a great step between two great countries that were at one time arch

adversaries, and that were able to grow beyond that and begin a new age of putting our resources into the positive advancement of our human civilization on this planet."

She stresses the importance of finding a common ground for the two space programs in terms of national pride as well. "We are very understandably proud of our space program. They are very understandably proud of theirs. We need to reach a common ground where we can acknowledge we both have really good programs" where the best aspects of both now are being joined to the best advantage. □

Editors note: Thagard and Dunbar will be sending "letters home" to their JSC family to be printed on an ongoing basis in the Space News Roundup.

'We are very understandably proud of our space program. They are very understandably proud of theirs. We need to reach a common ground.'

—Bonnie Dunbar



Vaughan named to lead value engineering

Chet Vaughan, deputy director of engineering, has been designated the focal point for value engineering activities at JSC.

In this position, Vaughn will organize the center's efforts to analyze the functions of systems, equipment, facilities, services and supplies to achieve essential mission requirements at the lowest life cycle cost consistent with performance and safety requirements. Vaughn will be supported in his efforts by the Procurement Support Division.

Woman of the Year honor

Nancy Hutchins, data manager in the Information Services Branch, was named 1994 Woman of the

JSC

People

Year by the Clear Lake Chapter of the American Business Women's Association.

The award recognizes Hutchins' involvement with the organization over an 11-year time span. She also is a past president of the local chapter.

Hutchins is a 20-year JSC employee. Her responsibilities include acting as Freedom of Information Act coordinator for the Center Operations Directorate.

Secretarial excellence award presented

Carla Bell was recently awarded the Marilyn J. Bocking Award for secretarial excellence.

Bell "serves as a role model for younger women just beginning their careers and for those who are proceeding up the career ladder," according to the award nomination. The nomination commended Bell's diligence, dedication and professional expertise in developing an "excellent working relationship among all the secretaries' within the organization."

Bell received the award while acting as secretary to the manager of the New Initiatives Office.



Vaughan

Hutchins

Bell

Anumele

Anumele wins Marilyn J. Bocking Award

Matrenia Anumele was recently named winner of the Marilyn J. Bocking Award for Secretarial Excellence.

Anumele's "expertise, professionalism, and personal dedication have been extremely instrumental

in the success of the Mission Operations Procurement Branch," according to the award nomination. Anumele is the sole administrative support for the branch's procurement personnel and was cited for her "can do" attitude and attention to detail. Anumele has been an integral part of the procurement branch staff for six years.

Cosmic discoveries topic of seminar

(Continued from Page 1)

On Tuesday, the morning sessions begin at 8:30 a.m. with discussions on Planetary Volcanism—Venus and Earth; the Outer Solar System; Isotope Anomalies, Nebular Processes; and Timescales; and Lunar Regolith—Processes and Products. The afternoon sessions include presentations on Venus Surface Properties and Resurfacing; the discussion on comet Shoemaker-Levy 9; Interstellar Grains and Astrophysical Settings; Moon Rocks - Mostly Highland; and Metal-Rich Meteorites. That evening, the Lunar and Planetary Institute will host an education session display beginning at 6:30 p.m.

Morning sessions for Wednesday include: Interplanetary Dust Particles; Lunar Remote Sensing and Remote Sensing Techniques; and Ordinary Chondrites. The afternoon sessions begin at 1:30 p.m. with presentations on: Martian Geomorphology; Planetary Differentiation and Processes; Mercury—Ground-based and Space-based Exploration; and Solar and Cosmogenic Components.

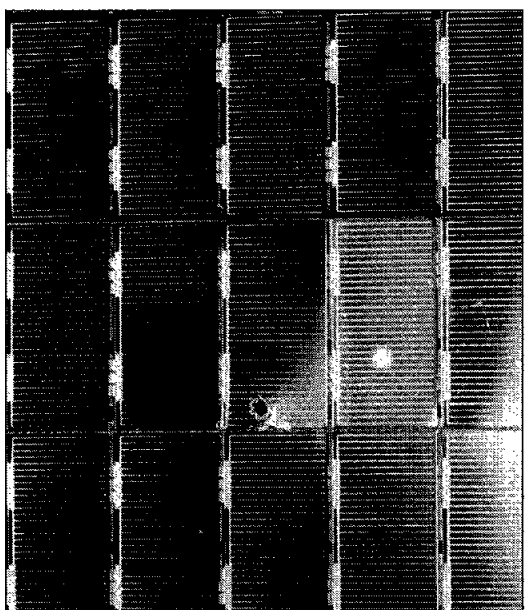
Thursday begins with morning sessions on: Mars Remote Sensing and Surface Composition; Terrestrial Impacts—Holes from Beyond; Chondrules; and Dimensionally Challenged Objects—Gaspra, Ida, Comets and IDPs. Sessions for the

afternoon include: Asteroids; Impact Experimentation and Theory—Guns and Coders; Primitive and Differentiated Achondrites; and Mars and Venus—Atmospheres, Dust and Weathering. The Lunar and Planetary Institute will host a second education display session beginning at 6:30 p.m.

Friday morning, sessions include: Martian Geophysics and Impact Processes; Impact Materials—Shock Geotherapy; and Carbonaceous Chondrites, Enstatite Chondrites, and Kaidun. The conference concludes following Friday morning's sessions.

For additional information contact LPI at 486-2166.

Right: After more than three years in space, this segment of a solar panel on the Hubble Space Telescope shows the affect of a micro meteoroid impact on one of its cells. The size of the hole is approximately 2 x 4 cm. Below: An engineer from the European Space Agency removes a sample of a thermal blanket from the HST's solar array that was returned to Earth following the STS-61 servicing visit in December.



ESA Photos



Research continuing on Columbia

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trol surfaces during landing. The problem cleared up after a second set of fuel line heaters was activated, but troubleshooters on the ground turned up several possible causes.

The STS-62 science activities run the gamut of space research—from materials processing to biotechnology, advanced technology and environmental monitoring. A total of about 60 separate investigations were planned, including five that are part of the United States Microgravity Payload-2 and the six that make up the Office of Aeronautics and Space Technology-2 complement.

Scientists operated the payload bay experiments by way of tele-science, sending commands from the ground and analyzing the data at the Marshall and Goddard Space Flight Centers.

USMP-2 Mission Scientist Peter Careri reported that all of the experiments were working well, and that the Critical Fluid Light Scattering Experiment-Zeno had achieved its objective of taking xenon to its "critical point" where it is simultaneously a gas and a liquid. At that point, the fluid exhibits mountainous compressibility. On Earth, however, gravity

reduces that peak to a bump on a curve.

"In two very different experiments, we have seen something that has never been seen quite in the same way about nature," he said. "For the first time, we were able to see what the peak is like without that squashing effect of gravity."

Dr. Marty Glicksman, principal investigator for the Isothermal Dendritic Growth Experiment, said it had successfully completed more than 20 growth cycles that will enhance understanding of how metals solidify, a crucial step in preparing of a large variety of metals and alloys used in casting and welding. The Rensselaer Polytechnic Institute scientist from New York said his team was working hard to stretch its most valuable on-orbit commodity, the film used to record the tree-like patterns.

"I use the NAS terminology of nominal, but I'm more tempted to use the Rensselaer student parlance, 'awesome,'" he said.

Scientists working with the Space Shuttle Backscatter Ultraviolet instrument continued to probe the layers of Earth's atmosphere and recorded data on emissions from Mexican and Central American volcanoes; sulfur

dioxide from industrial by-products in the troposphere above China and Japan; and observations in the mesosphere above the Mexican volcano Colima. SSBUV's measurements in general are used to fine-tune satellites that monitor the ozone and other gases in the Earth's atmosphere.

Controllers for the OAST-2 payload reported that their experiments are working well. Among them, the Spacecraft Kinetic Infrared Test, a study of the glow created as the shuttle encounters atomic oxygen, made several observations, including changes in the glow during a roll maneuver by *Columbia*. The Cryogenic Two Phase experiment, a technology being developed for future spacecraft cooling systems, also was operated.

Allen and Gemar went through several Lower Body Negative Pressure sessions in the continuing search for countermeasures to the adverse effects of living and working without gravity. The entire crew used the bicycle ergometer for muscle-toning exercise and tried out a new isolation system designed to keep vibrations from the exercycle from disturbing the science experiments.

Engineering students' futures

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A good engineer knows how to ask good questions."

George Salazar, an engineer in the Tracking Communications Division of the Engineering Directorate has participated in National Engineers Week for three years. "It's a way to share my own enthusiasm about science and engineering and maybe help shape these students' futures," Salazar said.

During his visit to a fourth grade class, he conducted a variety of experiments demonstrating basic

scientific principles. "Kids enjoy experiments they can interact with and understand," Salazar said. "It's great to hear back from the teachers that the students want to do more experiments."

Established in 1951 by the National Society of Professional Engineers, National Engineers Week now involves more than 17 professional organizations in its educational outreach efforts. For additional information on volunteering for next year's activities, contact Rhoads, ext. 30235.

Probe sights asteroid's moon

The Galileo spacecraft sighted the first moon of an asteroid ever observed during its August flyby of the asteroid, Ida.

Images taken by the spacecraft during its Aug. 28 pass by the asteroid are now being transmitted to NASA's Jet Propulsion Laboratory where they are being analyzed. Indications of a satellite circling the asteroid were given from sampled data from both Galileo's solid-state imaging system and its near-infrared mapping spectrometer.

Because Galileo is transmitting data back to Earth at a low rate of 40 bits per second, a complete image of the moon will not be available for several weeks.

Galileo has completed 90 percent of its 2.4 billion mile journey to Jupiter. The spacecraft will use an instrumented probe to explore the atmosphere surrounding the giant planet. Following that investigation, the spacecraft is expected to enter an orbit around Jupiter in December, 1995.

Group wins support award

The Spaceflight Meteorology Group recently was honored for its outstanding weather support of the shuttle program.

The National Oceanic and Atmospheric Administration awarded the group its Unit Citation in January. The citation recognized SMG's support of shuttle flights in 1992 and 1993. Despite a major facility move, the addition of several new staff members and absences of experienced staff members to attend a four-week NEXRAD Doppler Radar training course, the group provided uninterrupted weather support for all shuttle missions.

The award was presented by Al Dreumont, National Weather Service Area Manager for South Texas.

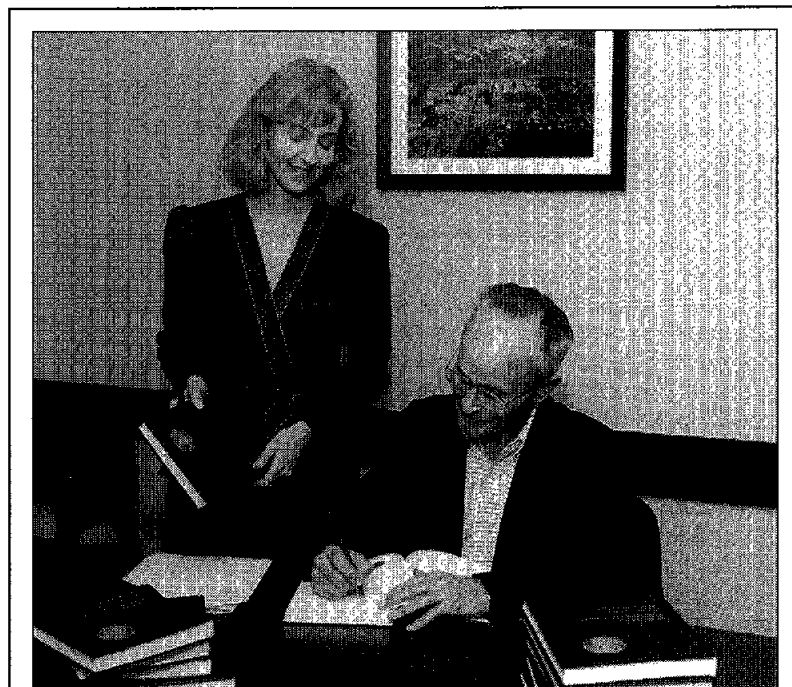
Space News Roundup

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

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

Swap Shop ads are due Fridays, two weeks before the desired date of publication.

Editor Kelly Humphries
Associate Editor Karl Fluegel
Associate Editor Eileen Hawley



JSC Photo by Bob Walck

Henry C. Dethloff, author of *Suddenly, Tomorrow Came*, the official history of JSC, autographs a copy of his book as Carol Homan, deputy chief of the Management Services Division looks on. A limited number of books is available through the Exchange Store.