

Quake quest

Beams are bouncing off Laser Geodynamics Satellite-II now that it has reached its high-Earth orbit. Story on Page 3.



Snoopy alert

Astronauts have been showing up in a JSC offices to present Silver Snoopy awards — and more are on the way. Story on Page 4.

Space News Roundup

Vol. 31

October 30, 1992

No. 42



NASA Electronic Photo

The crew of STS-52 gathers on the flight deck for one of several in-flight interviews that included the Cable News Network, Music Television and a crew press conference. Clockwise from left are Mission Specialist Tammy Jernigan, Pilot Mike Baker, Commander Jim Wetherbee, Mission Specialist Bill Shepherd, Payload Specialist Steve MacLean and Mission Specialist Lacy Veach.

Columbia, Hokule'a exchange alohas

Exploration voyages of past, present linked by radio

The Earth-orbiting crew of *Columbia* talked with the sea-voyaging crew of the historic Hawaiian canoe *Hokule'a* on Wednesday, linking the discovery methods of the past and present.

At the same time, students throughout Hawaii, plotting the course of the canoe's voyage, watched the televised conversation and asked both crews about exploration through space flight and sailing.

"Hokule'a, we on the *Columbia* would like to salute your voyage to discover parts of the past as we press on on our voyage to discover parts of the future," Mission Specialist Bill Shepherd said. "What we're doing today in space is literally just an extension of that human spirit."

The crew downlinked videotape of Pacific ocean with big island on horizon using long-lenses on cameras.

"We traveled over open ocean for nearly half an hour before the

Hawaiian Islands came into view," Commander Jim Wetherbee said. "That makes even more impressive the feats of the Polynesian explorers who settled the broad base of Polynesia thousands of years ago."

Columbia's crew also displayed a simple stone adz, found recently on Hawaii's big island. The stone-age tool carried on the shuttle is representative of those used to carve canoes that logged successes to equal European voyages centuries

Columbia crew sends LAGEOS; returns Sunday

The whirlwind of activity on board the Space Shuttle *Columbia* is scheduled to continue today, but the crew will begin packing its bags tomorrow for a return to Earth on Sunday.

Many of the STS-52 mission goals already are complete or well under way, including the deployment of Laser Geodynamics Satellite-II to begin measurements that may eventually help predict earthquakes and testing of the Canadian Space Vision System that is expected to be the forerunner of machine vision systems vital to Space Station *Freedom* assembly.

Columbia's crew successfully deployed LAGEOS-II at 8:56 a.m. CDT last Friday. Mission Specialist Tammy Jernigan flipped the switch that sent the 2-foot-diameter, prism-studded ball into orbit and 5 minutes later, the first of two solid rocket stages fired to propel it to a 3,666 nautical mile orbit. The stages both worked flawlessly and ground-based lasers have begun bouncing beams off the satellite to measure the movement of the Earth's crust. LAGEOS-II is expected to remain in its 6,000-kilometer orbit for 8 million years.

In a Monday interview with the Cable News Network, the crew got a chance to respond to concerns raised about whether the mission's goals of launching LAGEOS-II, working with the United States Microgravity Payload and a set of Canadian

experiments are worthy of a human space flight.

"Every mission we fly into space takes us one step closer to being able to operate in space and to live and work here full-time," said Mission Specialist Lacy Veach. "It's hard to assign a dollar value to any one mission or a dollar return to any one event. But the cumulative effect of what we're doing here is revolutionizing human life."



In the payload bay, the USMP-1 is sending reams of fundamental research data back to scientists on Earth who will use it to develop better computer memory systems, metals and semiconductors.

Operation of the USMP-1 experiments was going so well that Wednesday investigators for the MEPHISTO directional solidification furnace and the Lambda-Point Experiment discovered they could extend their operating times to record additional data.

"Crystal growers everywhere will be very glad MEPHISTO is doing these extra runs," said Dr. Don Gillies, assistant to the USMP-1 mission scientist. "Their data will help define how extensively shuttle maneuvers affect crystal growth. That information will be extremely valuable in planning future experiments."

The Lambda-Point Experiment didn't shut down its acquisition of

Please see **COLUMBIA**, Page 4

NASA to hold town meetings across America

NASA will host a series of town meetings across the country to involve Americans in developing a shared vision for the future of the U.S. civil space program.

"The space program belongs to the American people. For our space program to be successful, we must have a shared vision," NASA Administrator Daniel Goldin said.

"The town meetings will give the public an opportunity to learn about NASA's programs and to talk about what they believe should be the aspirations of the civil space program. We want every American to feel 'a pride of

ownership' in their civil space program," Goldin said.

This summer, review teams within NASA have been working to streamline major programs. The goal is to reshape NASA's activities to produce more world-class science and technology with greater efficiency and quality. In the process, NASA hopes to free up the resources necessary to push forward with new exploration projects.

As currently drafted, NASA's vision states: "As explorers, pioneers and innovators, we will boldly expand the frontiers of air and space for the benefit of all."

Elements of the emerging vision include sustaining human presence beyond Earth; increasing knowledge of planet Earth, the solar system and beyond; advancing aeronautics and astronautics through research; enhancing U.S. competitiveness and enabling private-sector involvement in aerospace through cooperation with industry, academia, and other government agencies, and; encouraging math and science education through discovery and example.

The town meetings are to acquaint the public with the emerging NASA mission and vision, to reach business-

es not yet involved and to gain input on how to accomplish the programs.

The meetings will include presentations by top NASA officials, as well as university researchers, members of the business community, educators and individuals from aerospace associations. Members of the audience will have an opportunity to present their views and to ask questions. Written submissions also will be accepted.

Town meetings are scheduled from 2 to 6:30 p.m. local time in the following places:

Nov. 9: North Carolina State University, Jane S. McKimmon

Center, Raleigh, N.C.;

Nov. 17: University of Hartford, Lincoln Theater, Hartford, Conn.;

Nov. 20: Indiana University-Purdue University, University Place Conference Center, Indianapolis;

Dec. 3: California Institute of Technology, Ramo Auditorium, Pasadena, Calif.;

Dec. 11: University of South Florida, Theatre 1, Tampa, Fla.;

Dec. 15: University of Washington, Student Union Building Auditorium, Seattle, Wash.; and

January 1993 — Denver, Colo., time and place to be determined.

Shuttle crew to work with Russian

Mission specialists named to International Microgravity Laboratory-2

By Barbara Schwartz

Marine Col. Charles F. Bolden Jr. will command STS-60 in November 1993 — the first shuttle crew to include a Russian — NASA announced Wednesday.

Other crew members are Pilot Kenneth S. Reightler Jr., a Navy captain, and Mission Specialists Franklin R. Chang-Diaz, Ph.D.; N. Jan Davis, Ph.D.; Ronald M. Sega, Ph.D.; and an experienced Russian cosmonaut.

"This flight is a significant milestone in future space exploration from a scientific research standpoint as well as being the first step in our cooperative agreements with our Russian partners," said Acting

Director of Flight Crew Operations Steve Hawley. "We can expect tremendous accomplishments from this group of individuals, considering the outstanding credentials and backgrounds they bring to this mission."

Bolden, 46, piloted two shuttle missions, STS-61C in January 1986 and STS-31 in April 1990, and commanded the STS-45 Atmospheric Laboratory for Applications and Science mission in March 1992. In addition to his flight experience, Bolden has held a number of management positions since his selection as an astronaut in 1980. Bolden was appointed assistant deputy administrator at

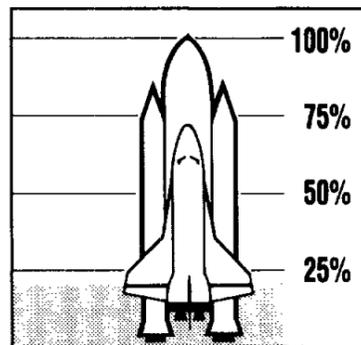
NASA Headquarters in April.

Reightler, 41, was pilot on STS-48 on which the crew successfully deployed the Upper Atmosphere Research Satellite. Reightler's current assignment is chief of the Mission Support Branch in the Astronaut Office and lead CAPCOM in Mission Control, responsible for communications with shuttle crew members during flight.

Chang-Diaz, 42, is a veteran of three space flights — STS-61C in January 1986, STS-34 in October 1989 and STS-46 in August 1992.

Davis, 38, flew on STS-47 Spacelab-J, a cooperative mission with the National Space Develop-

Please see **IML-2**, Page 4



1992 GOAL: \$440,000



JSC workers have many voting options

JSC employees who just can't get to the polls during their off hours may be excused by their supervisors to vote in Tuesday's election.

Since employees have been able to submit absentee ballots either by mail or in person for the past two weeks, however, most should not need an excused absence.

Federal personnel regulations provide that, where the polls are not open at least three hours either before or after employees' regular work hours, employees may be excused for the amount of time that will allow them to vote.

Please see **VOTE**, Page 4

JSC

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Gift Store from 10 a.m.-2 p.m. weekdays. For more information, call x35350 or x30990.

EAA Will Rogers Follies (2 p.m. Nov. 8, Music Hall): \$30.

Texas Renaissance Festival (9 a.m.-6 p.m. weekends through Nov. 15): adult, \$9.25; child (5-12): \$5.55. Festival bus trip (Oct. 24, Nov. 7): one-day trip; adult, \$15; child (ages 5-12), \$10; child (under 5), \$7.

Space Center Houston — Commemorative tickets available at \$8.75.

Metro tickets — Passes, books and single tickets available.

Fiesta Texas Park (San Antonio): Buy one, get one free. Adult, \$19.50; child 4-11, \$13.55.

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

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

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

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

Entertainment '93 coupon books, stamps, Walt Disney Club memberships also available.

JSC

Gilruth Center News

Sign up policy — All classes and athletic activities are first come, first served. Sign up in person at the Gilruth Center and show a badge or EAA membership card. Classes tend to fill up four weeks in advance. For more information, call x30304.

EAA badges — Dependents and spouses may apply for photo identification badges from 6:30-9 p.m. Monday through Friday. Dependents must be between 16 and 23 years old.

Weight Safety — Required course for employees wishing to use the Gilruth weight room is offered from 8-9:30 p.m. Nov. 4. Pre-registration is required; cost is \$5.

Defensive driving — Course is offered from 8 a.m.-5 p.m. Nov. 7. Cost is \$19.

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

Exercise — Low-impact class meets from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is \$24.

Bench aerobics — Class meets from 5:16-6:15 p.m. Mondays and Wednesdays. Cost is \$32 for eight weeks; participants must provide their own benches.

Aikido — Martial arts class meets Tuesdays from 6:15-8 p.m. Cost is \$15 per month.

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

Country and western dance — Beginning class will meet from 7-8:30 p.m. Mondays for six weeks beginning Nov. 2. Intermediate class meets from 8:30-10 p.m. Mondays. Cost is \$20 per couple.

Intercenter Run — JSC runners may now participate in the fall Intercenter Run competition among NASA centers. Participants may run or walk a two-mile or 10-kilometer course and turn their times into the Gilruth Center. All eligible participants will receive a free T-shirt.

Flag football — Men's flag football registration will be at 7 a.m. Nov. 9 at the Gilruth. Mixed league sign-ups will be at 7 a.m. Nov. 10.

Softball tournament — The Fall Classic Men's Open C Softball double-elimination tournament will be Nov. 7-8. Cost is \$95 per team. Registration deadline is 7 p.m. Nov. 5.

JSC

Swap Shop

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

Property

Rent: Heights, 3 rm efficiency, full kitchen/bath, cov parking. Mike, 868-5132 or 283-5890.

Sale: El Dorado Trace condo, 1-1.5-1cp, all appl, patio, balcony, FPL, fans, designer carpets/wallpaper, assumable, low equity. Barbara, 488-3383.

Lease: Heritage Park, new section, 3-2-2, no pets, \$725/mo. + dep. x35021 or 486-7268.

Sale: Pearland, 3-3-3, built in spa, patio, fans, all elec, custom built home. 481-1469.

Sale: Friendswood, Lux French Country Estate, 4-3.5-3D, 3478 sq ft, located on 5.7 acre, another 5.3 acre avail, \$365K. x39250 or 986-8471.

Lease: Nassau Bay, TH, 2-2.5-2cp, lg BR, private enclosed patio, french doors, remodeled kitchen, FPL, W/D, \$750/mo. 333-5056.

Rent: 2-2.5-2, FPL, refrig, dishwasher, W/D conn, \$650/mo. 583-1369.

Rent: Galv condo, furn, sleeps 6, Seawall Blvd & 61st St, Wkly/wknd/daily. Magdi Yassa, 333-4760 or 486-0788.

Lease: Webster, 3-2-1 attached, lg open living area, fenced, no inside pets, avail mid Dec, \$950/mo w/equl dep. 482-1685.

Sale: LC, Countryside, 3-2.5-2a 2-story, fenced corner lot, cov deck, all BR up, int util rm, new flooring, paint, wallpaper, CCISD, \$65.9K. 554-7623.

Sale: CLC, 1-1 condo, W/D, refrig, alarm, FPL, owner moving, \$26.9K OBO. 280-9740.

Sale: SW Houston, 2-2 condo, W/D, refrig, lg patio, FPL, \$29.9K. 280-9740.

Rent: Arkansas lake cabin, furn w/antiques, screened, accommodates 8, \$250/wk, \$50/day. x33005 or 538-4141.

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

Lease: Countryside, 3-2.5-2, 2 story, 1800 sq ft, mauve carpet, fans, avail Nov 1, \$759/mo. 283-5332 or 326-1390.

Sale: Galv beach house, 3-2-1, CA/H, furn. Ed Shumilak, x37686 or 326-4795.

Rent: Galv beach house, D/W, CA, furnished. Ed Shumilak, x37686.

Cars & Trucks

'82 Vanagon L camper, rebuilt, remodeled, 10K new mi, \$5.5K. Mike, 283-5890 or 868-5132.

'87 Chevy IROC/Z28, V8, auto, PW, PDL, elec, pull-out stereo, 4 new tires, \$5K OBO. Ron, x38785 or 409-945-8787.

'84 Olds Cutlass Supreme, gray, V6, extras, 124K mi, orig owner, \$2K OBO. Dennis, 474-5400.

'77 Gran Prix, new eng ('91), new trans ('90), new alternator, starter, radiator, master

cylinder, \$1K OBO. David, 554-5514 or 282-3827.

'63 Corvette, split window coupe, red, factory AC, 4 spd, pw, \$22K. Tim, x38843 or 332-6153.

'89 Toyota PU, extra cab, V6, 3.0L, standard, AC, AM/FM/cass, bedliner, maint records, \$7.5K. Calvin, x32006 or 692-6599.

'88 Chevy Custom Van Mark III, 22.5K mi, \$12.5K. x35421 or 485-6416.

'78 Chevy Malibu wagon, 305 V8, body, AC, interior, ex. cond, 70K orig mi, \$1395. x35180 or 326-3706.

'85 Fiero SE, 2.8L, V6, auto, 37K mi, ex cond, \$3.2K OBO. x34416 or 532-1003.

'65 Ford Mustang, body in good cond, needs paint job, 351 rebuilt Windsor eng, not mounted, \$1K OBO. Brenda, 283-7548.

'86 Pontiac Fiero SE, sunroof, gold/blk, ground effects, auto, V6, good cond, \$4.1K. 475-0101 or 334-4808.

'86 Pontiac Grand Am, V6, auto, 4 dr, tilt, cruise, new AC compressor, \$3450. Jeri, 333-7552.

'85 BMW K100RS blk, removal saddlebags, new brakes, batt, shocks, ex cond. Roger, x39120 or 554-4960.

'81 Dodge Omni, 4 dr, auto, air, ex cond, \$850 negotiable. 946-6814.

'85 Mercury Cougar, dk blue, AM/FM/cass, all pwr options, AC, auto, new tags, good tires, ex cond, \$3950 OBO. Dave, 333-6062 or 847-3146.

'84 Cadillac, Sedan Deville, dk blue w/landau roof, 4 dr, V8, AC, tilt, cruise, AM/FM, stereo, 86K mi, ex cond, \$3.7K. 538-1107.

'90 Nissan 240 SX, loaded, maint records, new tires, alarm, int and ext ex cond, orig owner, \$1.9K OBO. Bryan, 944-2155.

'89 Chevrolet Baretta GT, V6, 2.8L, dual exhaust, pwr, cruise, cassette, ex cond, 30K mi. Paul, 333-7369.

'90 Plymouth Laser RS turbo, red/gray, 36K mi, AM/FM/cass/CD, all pwr, \$10,975 OBO. Linda, 280-9486.

'77 Camaro, auto, AC, radio, new carpet, low mi, one owner, good cond, \$1.1K OBO. 333-3247.

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JSC

Dates & Data

Today

Cafeteria menu — Special: Salisbury steak. Entrees: fried shrimp, deviled crabs, ham steak. Soup: seafood gumbo. Vegetables: buttered carrots, green beans.

Monday

Space art — The Lunar and Planetary Institute will present a collection of original oil paintings by space artist Mike Sanni from 9 a.m.-5 p.m. Monday through Friday Nov. 2-12. The exhibit, at 3600 Bay Area Blvd., is entitled "The Moon the Sun and the Stars."

Cafeteria menu — Special: hamburger steak. Entrees: beef Burgundy over noodles, fried chicken. Soup: cream of chicken. Vegetables: buttered corn, carrots, green beans.

Tuesday

Lunch and learn — The American Institute of Aeronautics and Astronautics Space Imaging and Astronaut Observations Technical Committee will present a lunch and learn discussion at noon Nov. 3 in Bldg. 31, Rm. 129. Lockheed's Clyde Sapp will discuss "Two and Three Dimensional Blob Analysis Techniques." For more information, call Kam Lulla at x35159 or Michael Snyder at x35171.

Cafeteria menu — Special: turkey and dressing. Entrees: baked meatloaf, liver and onions, barbecue spare ribs. Soup: beef noodles. Vegetables: Spanish rice, broccoli, buttered squash.

Wednesday

SimTec '92 — SimTec '92 and the International Simulation Technology Conference with the Workshop on Neural Networks will meet Nov. 4-6 at the South Shore Harbour Resort and

Conference Center. For more information, call Tony Sava at 282-8696, or Robin Kirkham at 333-7345.

Astronomy Seminar — JSC Astronomy seminars will host a luncheon meeting from noon to 1 p.m. Nov. 4 in Bldg. 31, Room 129. Guest speaker will be Dr. Tom Wilson discussing "Space Physics and Astronomy from a Lunar Post." For more information, contact Al Jackson at 333-7679.

Toastmasters meet — The Spaceland Toastmasters Club will meet at 7:15 a.m. Nov. 4 in the Bldg. 3 cafeteria. For more information, call Darrell Boyd at x36803.

Cafeteria menu — Special: Spanish macaroni. Entrees: broiled fish, tamales with chili. Soup: seafood gumbo. Vegetables: ranch beans, beets, parsley potatoes.

Thursday

TSO open house — JSC's Technical Services Division will host an open house for all JSC and contractor employees from noon-3 p.m. Nov. 5. The 120,000-square-foot shop complex in Bldgs. 9 and 10 house the latest in fabrication equipment and a staff of skilled mechanical, engineering and electronics technicians.

Professional development — The National Management Association's Texas Gulf Coast Council will present "Management Skills in a Constantly Changing Environment," a professional development seminar, Nov. 5-6 at the Holiday Inn Hobby. For more information, call Mary Jo Weible at 282-4778, or Gerry Stacy at 280-2181.

Cafeteria menu — Special: chicken fried steak. Entrees: beef pot roast, shrimp chop suey, pork chops. Soup: navy bean soup. Vegetables: carrots, cabbage, green beans.

Nov. 6

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

Nov. 7

Fuzzy logic — The Fuzzy Logic and Neural Networks Symposium will meet from 8:30-5 p.m. Nov. 7 at the South Shore Harbour Resort and Conference Center. For more information, call Troy Henson at 282-7476.

Nov. 12

AIAA meets — The American Institute of Aeronautics and Astronautics Houston Section will meet at 5:30 p.m. Nov. 12 in the Gilruth Center. Bob Young, president of Lockheed Corp's Technology Services Group, will discuss "Quality Trends in the Aerospace Industry." Cost is \$9 for members, \$10 for nonmembers and \$8 for students. Reservations are due at noon Nov. 9; call .31350, 333-6064, 283-4214 or 282-3160.

Technical meeting — The AIAA's Guidance, Navigation and Flight Control Technical Committee will meet at 11:45 a.m. Nov. 12 at the Gilruth Center. McDonnell Douglas' Jim Treece will present an "ASA Simulation Development System Overview." For more information, call David Clark at 332-2484, or Rob Carmody at 283-4101.

SSQ meets — The Society for Software Quality will meet at 5:30 p.m. Nov. 12 at the Days Inn on NASA Road 1. Rockwell's Lynn Lunney will discuss "Software Quality in the Manned Space Program." For more information, call Felix Balderas at x31945.

Boys 20" Huff bike, blue, ex cond, \$35. 532-1673.

Raleigh 10 spd bike w/2 extra tires, \$50. x38373.

Men's mountain bike, Trek 830 Antelope, small frame, extra set of off-road tires, \$300. 480-4432.

Audiovisual & Computers

Macintosh SE, 4 MB w/20 MB Apple HD, \$950. 488-7771.

Pioneer 4 x 10" triaxial car spkrs, \$50. Frank, x39924 or 992-3515.

Apple IIe computer, \$100; Apple II GS, RGB monitor, mouse, stereo card, spkrs, printer, \$900; Yamaha Clavinova musical kybd, 2 pedals, weighted keys, \$800; 286 motherboard, \$80, all prices negotiable. Ken, 576-2372 or 280-2239.

Nintendo games, Dragon Warrior II, \$30; Dragon Warrior I, \$13; RC Pro Am, \$15; Major League Baseball, \$13; Punchout, \$15; Dash Galaxy, \$12. Richard, 532-1673.

Hercules compatible mono video card w/parallel port, \$20; Aces Hercules compatible mono, \$45; Zenith Z-549 VGA video card, 640 x 480, 16 colors, \$35. x37137 or 482-8966.

Nikko stereo sys, amp, tuner, surround sound unit, \$250, spkrs for sale separately. 333-6943 or 409-948-3039.

Logitech mouse, 3 manuals, all cables, \$25. E. Rubenstein, x34807 or 532-2211.

Okidata Model 93 printer, parallel input, w/tractor feeder, slight head damage, \$40. Speier, 333-2263.

2 Motorola FM 2-way mobile radios, 100 w ea., low band, antennas, control heads, spkrs, microphones, schematics, all wiring, both sets for \$150; Atari-ST IBM emulator, software, \$85; Discovery cartridge for Atari-ST, \$85; Technician toys, stereo, cass deck, plugs, cables, connectors, elec components, \$25 takes everything. Howie, 482-8354 or 282-3841.

Fischer T920 3 way spkrs, 200 watts, 12" woofer, \$200. Trey, x36759 or 992-1076.

Pets & Livestock

Free to good home, female cat, striped, short hair, spayed, iron declaw, current shot records. Fisher, 480-2584.

AKC Rottweiler pups, \$250. Stephanie Haynes, 409-948-6970.

AKC chow-chow pups, 2 red/1 blk, male, \$200; 1 red female, \$250, parents on premises. Jackie, 282-4337 or 554-7305.

AKC miniature Schnauzers, m/f, 6 wks, blk/silver, salt/pepper, \$150 to \$175. 922-7240.

Musical Instruments

Student guitar w/case by Goya, good cond, \$75. Shelly, 283-1834 or 332-4807.

Personal

50th Reunion, Milby H.S. Class of '43, May 20-21, Hobby Hilton, if you are a member, call Charley McKenney Sellman, 493-0497.

Household

Fabric covered kg sz hdbd, peach, \$75; 8' x 12' wool rug, navy w/center medallion, border of oriental bird motif, \$250. 480-9184.

Sears 27" color tv w/remote, \$200. Jody, 282-3155 or 409-948-6128.

Lg, 6' x 3' oak finish desk w/4 reg drws, 1 filing drwr, ex cond, rolling office chair, was \$1K, now \$750; 3 pc BR set, hdbd, dresser, mirror, fair cond, was \$450, now, \$150. x37038 or 333-2938.

Brass FPL tools, \$30; brass chandelier, \$125; Easy Glider exerciser, \$45; pale gold loveseat, matching chair, steel frame, good cond, \$175; Olivetti portable elec typewriter, \$50; 2 toasters, make offer. Louise, 992-1595.

Qn sz sleeper sofa. 474-3517.

Heavy duty clothes washer and dryer, \$75/ea. 332-2229.

Couch, Furniture Idea, lt color, sm floral design, ex cond, \$250; 3 matching tables, behind the couch, 2 end tables, \$95 for 3. 339-1152.

Full sz office desk w/wood laminate top, 5 drws, \$40. 482-3428.

Kg sz bed w/hardwood frame trimmed w/brass, ex cond, spread, pillows, sheets, matt cov, \$225; keg refrig, 20 cu ft, w/icemaker, incl empty keg, gass bottle, all hoses, \$275. x39282 or 335-0641.

Sears w/elec stove w/continuous cleaning oven, \$200; brass FPL screen, \$20. 480-3424.

Sm china buffet/hutch, approx 72" h x 17" d x 30" w, dark veneer, glass insets in top drs, bottom stor, 1 drwr, ex cond, \$100. Janine, 283-7541 or 482-7550.

Couch, chair, ottoman, good cond, \$150 OBO. Rob Kelso, x35483 or 480-2997.

Brass/wht full sz hdbd, 2 wooden twn sz hdbd. 326-2307.

Dining rm table w/center leaf, mar/stain resistant simulated wood top, 6 blk vinyl, chrome chairs, ex cond, \$175 OBO. 482-7774.

Dinette w/4 chairs, \$50; lawnmower, \$40; end tables, \$30/pr, nightstand, \$20; 3 way lamps, \$20/pr, weight bench, \$15; grass trimmers, \$5/ea. Bill, x30164 or 487-7059.

Coffee table, microwave, oven, end tables, all items best offer. Ray, 283-5824.

Qn sz semi-motionless waterbed w/hdbd, nightstands, \$150. Karen, x35466 or 992-1076.

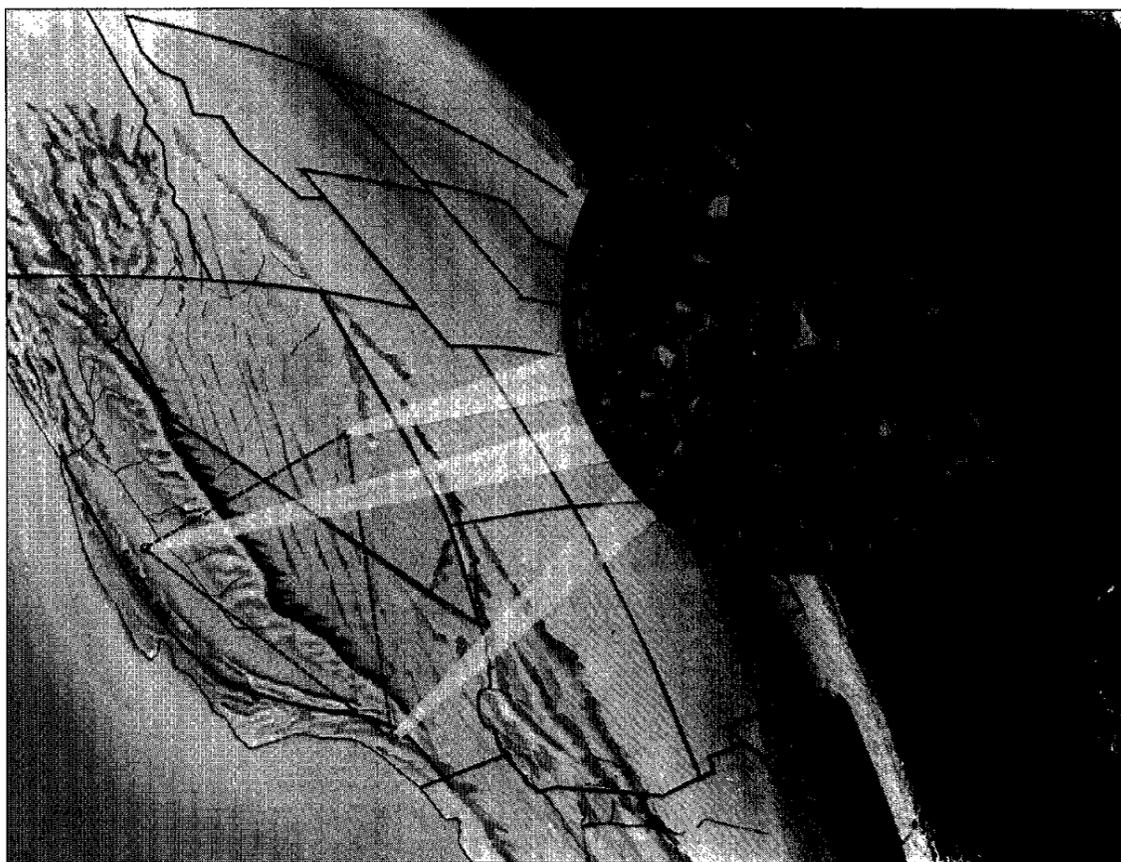
Wanted

Want desk, wood, sm sz, 24" x 36" in good cond, Magdi Yass, 333-4760 or 486-0788.

</

Quake Quest

Laser Geodynamics Satellite will help scientists understand effects of Earth's shifting crust



Whether they like it — or even know it — folks in sunny southern California are now on the move toward frigid Alaska where their descendants are expected to arrive in about 150 million years.

They are riding on one of the crustal plates that constitute the Earth's surface and it is moving north toward a collision with Alaska.

Figuring out the consequences of this geologic dance is the job of Laser Geodynamics Satellite-II, deployed by the crew of *Columbia* at 8:56 a.m. last Friday.

"Houston, we see a good deploy," Mission Specialist Tammy Jernigan reported to Mission Control after she deployed the satellite.

Dr. Miriam Baltuck, the LAGEOS-II program scientist, reported that the satellite is being successfully tracked by ground laser stations. The first contact was made at dusk local time early Saturday morning from the tracking station in Ororal, Australia. The satellite was subsequently tracked from Easter Island in the Pacific, California and Goddard Space Flight Center in Greenbelt, Md.

LAGEOS-II's primary purpose is not to check the accuracy of predictions about plate collisions, but to better understand earthquakes and volcanic eruptions caused by plates sliding past one another.

"Most earthquakes and volcanoes are located along the boundaries between Earth's crustal plates," Baltuck said. "To be able to mitigate the damage they can cause, we must understand the processes that create them. LAGEOS-II will help us do that."

Like LAGEOS-I, launched in 1976 and still in service, LAGEOS-II is dedicated to satellite laser ranging. In SLR, ground-based lasers transmit intense, short pulses of light to a satellite equipped with retroreflectors. The retroreflectors on the surface of LAGEOS-II are three-dimensional prisms that reflect the laser back to its source.

By recording the round-trip travel time of the pulse, scientists can determine the location of the laser station on the Earth's surface. Over time, scientists can determine how the laser

stations around the world have moved and therefore measure how the plates of the Earth's crust are moving.

"Changes in the round-trip time are due either to very tiny changes — as small as a millimeter — in the ground station's location or to changes in the satellite's orbit which respond to changes in the Earth's gravity field," Baltuck said.

The Italian space agency, Agenzia Spaziale Italiana, built LAGEOS-II from NASA drawings and hardware. It is a spherical satellite made of aluminum with a brass core. LAGEOS-II is only 24 inches (60 cm) in diameter, yet weighs about 900 pounds (405 kg).

This compact, dense design was selected to make the satellite's orbit as stable as possible so that its position can be determined with a high degree of accuracy.

The satellite is covered with 426 retroreflectors, about 1.5 inches (3.8 cm) in diameter. Each retroreflector is a prism that reflects a light beam back to its source.

GSFC and ASI have assembled 27 teams of investigators to work on LAGEOS-II. They represent the U.S., Italy, Germany, France, the Netherlands and Hungary. The investigations planned for LAGEOS-II include plate tectonics — the motion of the plates of the Earth's crust — the Earth's rotation, Earth's gravity and the accurate determination of the length of the day.

"LAGEOS-II is a joint mission of NASA and ASI," Baltuck said, "which is important because global monitoring of the Earth requires global participation. About 30 countries will be tracking LAGEOS-II from 65 sites around the world."

The global network of more than 30 stations provides a basic framework for determining plate motion, confirming the expected motion

for most plates. SLR studies have shown how stress is distributed and stored within the boundary zones between the two large plates divided by California's San Andreas Fault. LAGEOS-I data shows that the Hawaiian island of Maui is moving toward Japan at about 2.8 inches (7 cm) a year and away from South America at 3.1 inches (8 cm) a year.

Adding a second LAGEOS satellite will provide even more results, Baltuck said.

"LAGEOS-II will double the number of measurements over our most important sites," she said. "It will also reduce the problems caused by cloudy weather and will enhance our modeling of the Earth's gravity field. Its orbit has been designed to improve coverage of the Mediterranean, a poorly understood and geologically complex area that is naturally of great interest to our Italian partners."

The theory of plate tectonics tries to explain how the continents got to their current positions and predicts where they will be in the future. Scientists theorize that up until about 200 million years ago there

was one giant super-continent where the Atlantic Ocean is today. It was called Pangaea, which means "all lands." The word is a combination of the prefix pan, which means all, and the Greek word gaea, which means land or Earth.

Then, about 180 million years ago, Pangaea started to break up into several continents. The plates carrying the continents drifted away from each other with a low layer of rock forming between the plates. Today, the plates comprise the solid outer 60 miles (100 km) of the Earth.

The plates move slowly, generally no faster than 6 inches (15 cm) a year. To cite one example, North America and Europe are moving apart at about 1.2 inches (3 cm) a

year. Today, they are about 3,000 miles (4,828 km) apart. When the two continents originally split, the low layer of rock between the continents grew, sank and was gradually inundated to become the Atlantic Ocean.

Although the plates' motions are slow when averaged over time, the effects of their short-term drastic movements can be catastrophic. Plates may bump into one another, spread apart or move horizontally past one another, causing earthquakes, building mountains or triggering volcanoes.

LAGEOS-II scientists also will use the data to look at changes in the location of the Earth's axis of rotation which causes a movement or "wobble" at the north pole. The Earth is not perfectly round, and the material beneath the Earth's surface and its atmosphere is not equally distributed around the imaginary line around which the Earth spins. This causes a small "wobble" in the Earth's rotation much like the motion of a child's top. The spin rate varies by only a few thousandths of a second which changes the length of the Earth's day.

Understanding the Earth's wobble and rotation rate provides important insight into how mass shifts above and within the Earth. Through measurements using the LAGEOS satellites, scientists can detect changes in polar motion to an accuracy of 2 inches (5 cm) and changes in the length of the day to within one ten-thousandth of a second.

The Earth's gravity plays a large part in controlling the orbit of a satellite. Because the Earth is neither perfectly round nor equally dense through its interior, gravity varies from place to place around the globe. In addition, tides, caused by the gravity of the Sun and the Moon pulling on the Earth, cause the Earth's mass to shift within a period of hours. Using laser ranging with the LAGEOS satellites, scientists can measure large-scale changes in gravity. Studying these changes helps scientists understand better the properties, as well as the strength and behavior of materials deep within the Earth. □



NASA ☆ ASI



NASA Photos

Top: Now that Laser Geodynamics Satellite-II has been deployed, the world has two satellites in orbit that can verify each other's measurements of the Earth's plate tectonics. This artist's concept shows how LAGEOS I and II use laser beams reflected back to the ground to pinpoint the movements of the crust in areas such as California's San Andreas Fault. Left: Mission Specialists Tammy Jernigan, left, and Lacy Veach prepare to deploy LAGEOS-II. Above: The 2-foot-diameter satellite and its Italian Research Interim Stage rise out of Columbia's payload bay.

Seven astronauts get nod for upcoming missions

(Continued from Page 1)

ment Agency of Japan, in September 1992.

Sega, 39, will be making his first shuttle flight. An Adjunct Professor of Physics at the University of Houston, Sega is a co-principal investigator of the Wake Shield Facility which is manifested on the flight.

An experienced cosmonaut will fly on STS-60. The Russian Space Agency has nominated Col. Vladimir G. Titov and Sergei K.

Krikalev to undergo mission specialist training. One cosmonaut will be designated the prime crew member and the other designated backup crew member. The cosmonauts are scheduled to arrive at JSC in November.

Mission objectives include a number of microgravity experiments in SPACEHAB-2, the Wake Shield Facility experiment to test the creation of an ultra-vacuum in which to produce extremely pure thin film

crystals for industrial uses ranging from microelectronics to lasers and superconductivity and a Capillary Pumped Loop Experiment to study a method of heat dissipation in space. Russian Space Agency-sponsored life science activities also will be included in the mission.

Astronauts Leroy Chiao, Ph.D., and Donald A. Thomas, Ph.D., were assigned Tuesday to be mission specialists on STS-65, the International Microgravity Labor-

atory-2 mission scheduled for June 1994.

Chiao, 32, has worked on space shuttle flight software verification in the Shuttle Avionics Integration Laboratory and currently is working crew equipment issues in the Mission Development Branch of the Astronaut Office.

Thomas, 42, has worked on issues relating to the shuttle orbiter systems in the Safety and Operations Development Branches of the

Astronaut Office. He currently is serving as a CAPCOM, an astronaut in the Mission Control Center who communicates with space shuttle crew members during a mission.

Other crew members previously named to STS-65 are Payload Commander Richard J. Hieb and Chiaki Mukai, Ph.D. and M.D., a payload specialist from the National Space Development Agency of Japan.

JSC to offer CPS classes

JSC's Human Resources Development Branch will begin a new set of preparation classes for the Certified Professional Secretary examination this week.

Classes will be presented by San Jacinto College Central faculty in Bldg. 45, Rm. 251. The schedule is:

Accounting: 1-4 p.m. Nov. 2-Dec. 21;

Behavioural science: 1-4 p.m. Dec. 28-Feb. 8;

Economics and management: 1-4 p.m. Feb. 22-April 5;

Business law: 3-6 p.m. April 19-May 24;

Office Technology, 3-6 p.m. June 7-July 19; and

Office administration and communications: 3-6 p.m. July 26-Aug. 30.

The CPS examination is administered twice a year, the first Friday and Saturday of May and the first Thursday and Friday of November. Applications are due no later than March 1 and Sept. 1, respectively.

JSC secretaries who wish to attend should submit a Form 75 to Estella Gillette at AH3 before the date of the desired session. Contractor secretaries may attend, but must pay San Jacinto directly. Call x33077 for more information.

Employees may be excused to vote

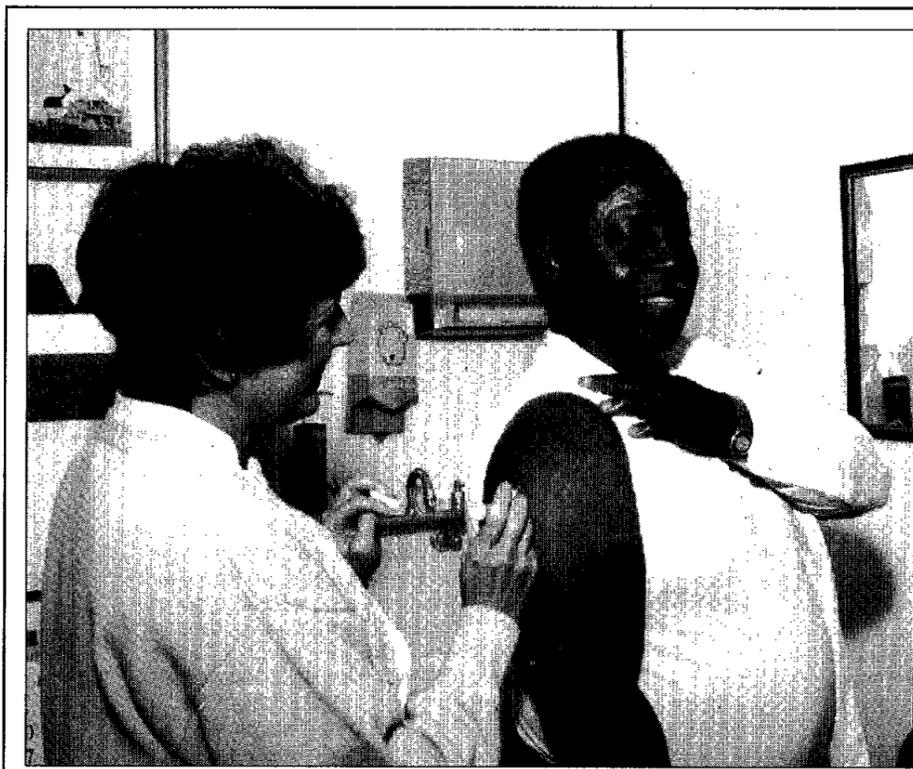
(Continued from Page 1)

This means that employees who work from 7:30 a.m.-4 p.m. are not eligible for excused absences. But employees who work from 8 a.m.-4:30 p.m. are eligible for half an hour, and employees who work from 8:30 a.m.-5 p.m. or are on an irregular tour are eligible for an hour.

Employees on irregular tours may not use an excused absence if it puts them in overtime status, and those who are on their first 40 hour irregular tour should receive about the same amount of time given to other people in the office.

Absences will be permitted only at the beginning or end of the work day. Employees who prefer to vote at some other time may use annual leave, comp time or leave without pay.

For more information, call the Human Resources Office at x30618.



SHOT IN THE ARM — Robert Ligons of the Space Shuttle Program's Information Systems Office gets an influenza vaccine from Sharon Briceno, a registered nurse at the JSC Clinic. The clinic is offering the free flu shots between 10 a.m. and noon and 2 to 3:30 p.m. daily. For more information, call the clinic at x34111.

JSC Photo by Benny Benavides

JSC declares open season on health benefits

JSC employees will have the opportunity to change health insurance plans and options when Open Season is declared Nov. 9-Dec. 14. They'll also be able to learn about their options at an upcoming Health Fair.

The Health Fair, sponsored by the JSC Human Resources Office, will be from 9 a.m.-4 p.m. Nov. 13 in the Gilruth Center ballroom. Health care representatives will present their 1993 packages to

help employees choose the best insurance policy.

Premiums will increase an average of 9 percent in 1993. This is the third consecutive year that the increase has been under 10 percent — less than half the 20-percent trend seen in private industry. Government contributions will cover 72 percent of the average premium.

The National Treasury Employees Union and the CIGNA/

EQUICOR Health Plan of Houston will not participate next year, so individuals enrolled in those plans must select new plans during Open Season.

Also in 1993, health plans will increase the number of doctors and hospitals available through preferred provider networks. The use of these networks has proven to be helpful in providing quality health care at lower costs.

Eligible employees who have pre-

viously declined health benefits may enroll during Open Season, as well.

All enrollments and changes will be effective Jan. 10.

Employees who are retiring before the effective date and who are contemplating changes should contact their retirement counselor as soon as possible.

For more information, call the Employee Services Section at x32681.

Silver Snoopy lands in several JSC offices

Members of the Astronaut Corps have been busy making presentations of the coveted Silver Snoopy award during the past several months.

Among the civil service employees who have received the prestigious award are Neil Kunkel, Pat Kidwell and Phil Cleary of the Administration Directorate; Kandy Hosea of the

Flight Crew Operations Directorate; Joe Melugin, Mary Harris, Harry Chang and Malcolm Jones of the Engineering Directorate; Bob Lowe, Elsie Johnson and Debra Griffin of the Center Operations Directorate; Sarah Lai and Tom Matuszewski



of the Safety, Reliability and Quality Assurance Office; and Charles Young of the Space Shuttle Engineering Integration Office.

The Silver Snoopy is the astronaut's own personal award for outstanding contributions toward mission success

and flight safety. It is presented to less than 1 percent of the entire NASA and contractor work force annually.

More presentations are scheduled at JSC before the year ends. Watch for the poster of Snoopy riding atop the shuttle, which signifies that someone in your area will be receiving a Silver Snoopy soon.

Radio contact with Hokule'a links both ends of exploration spectrum

(Continued from Page 1)

before those voyages began, said Mission Specialist Lacy Veach, a Honolulu native.

"There are compelling similarities between space and ocean exploration," said Myron Thompson, president of the Polynesian Voyaging

Society. "The discovery and settlement of Hawaii marked the end of the first phase of human's migration using stone age technology. The voyages of the shuttle mark the other end of this spectrum of discovery and exploration."

The Hokule'a set sail last Friday

from the Cook Islands on a journey to the Hawaiian Islands. The double-hulled, 65-foot canoe is a replica of the vessels used by the Polynesians who, as early as 3,000 years ago, explored the 20 million square miles of ocean. They discovered and settled Samoa, Tonga, the

Marquesas, the Cooks, the Societies, the Tuamotus, Easter Island, New Zealand and finally Hawaii.

Carbon dating indicates that Polynesians sailed 2,500 miles from the Marquesas to first colonize Hawaii around 250 A.D. The

Hokule'a is retracing that route. Today, only 10 Polynesians practice the ancient art of Polynesian navigation called Wayfinding. These navigators memorize star paths and other natural signs, combining them with their knowledge of currents and weather and sailing strategies.

STS-52 crew ending voyage of technological discovery

(Continued from Page 1)

high-resolution data on the transition of helium from its mysterious superfluid condition to normal liquid until Thursday, when its supply of helium ran out. LPE passed through the transition temperature, or lambda point at -456 degrees Fahrenheit, more than 40 times.

Canadian Payload Specialist Steve MacLean and Mission Specialist Lacy Veach began work with the Space Vision System on Saturday, grappling the domino look-alike Canadian

Target Assembly with the shuttle's Canadian-built robot arm and reberthing it after initial tests.

SVS work resumed in earnest Thursday as MacLean put the machine vision system through its paces, sending down precise computer-generated images and detailed position data of arm maneuvers that will be needed for space station assembly and repair of the Hubble Space Telescope. The evaluations are to continue today and Saturday.

The flight has not been without its

troubles. Monday, furnace No. 2 of the Crystal Vapor Transport Experiment prematurely went into the idle mode and was deactivated. Investigators continued work with furnace No. 1.

The text and graphics system jammed Wednesday, and on Thursday the computer for Sun Photo Spectrometer Earth Atmosphere Measurement-2 failed. The hand-held instrument is being used to measure the amounts of ozone and nitrogen in the upper atmosphere.

Flight controllers at JSC immediately began working on an in-flight maintenance procedure that would use the payload support computer in its place. Earlier in the flight, Veach had spliced wires near the computers' battery terminals to allow it to operate off of the shuttle's electrical power.

Columbia is scheduled to land at Kennedy Space Center's Shuttle Landing Facility at 8:05 a.m. CST Sunday. A welcome home ceremony is scheduled at Ellington Field about 10 hours after landing.

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.

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