



Space News Roundup

Vol. 28

October 20, 1989

No. 42

Promotions bump shuttle managers

The space shuttle program will have a new director following the successful completion of the STS-34 Galileo mission, NASA Administrator Richard H. Truly announced Monday.

Arnold D. Aldrich will become associate administrator for the Office of Aeronautics and Space Technology (OAST) following the mission, and former astronaut Robert L. Crippen will assume the responsibilities of directing the National Space Transportation System (NSTS) Program.



Aldrich

Astronaut Brewster Shaw will take over for Crippen as deputy director of NSTS Operations and chairman of the Mission Management Team that makes the final "go-no go" decision for all shuttle launches.

In his new position, Aldrich will be responsible for the direction of NASA's aeronautics and space technology programs as well as for the institutional management of Ames Research Center, Langley Research Center, and Lewis Research Center. Aldrich, currently NSTS director, led the shuttle's safe and successful return to flight.

Crippen, a Navy captain, will have full responsibility for the operation and conduct of the space shuttle program and will report directly to Dr. William B. Lenoir, acting associate administrator for space flight. Crippen currently is deputy director of NSTS Operations.

"I'm delighted that NASA has two outstanding executives in Arnie Aldrich and Bob Crippen who are so well prepared to take on these important new responsibilities," Truly said. "It speaks well for the inherent strength of the NASA organization. These management changes bode well for a strong future in NASA's aeronautics and technology programs, as well as insure stability in the space shuttle leadership."

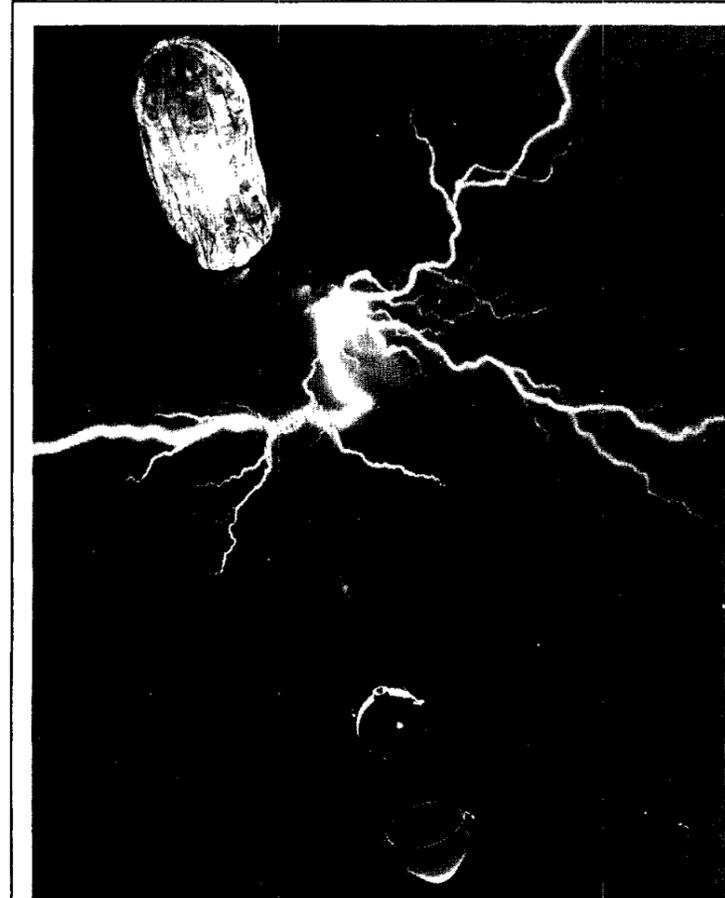
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Ozone hole matches record seen in 1987

Continuing satellite observations have confirmed that the ozone hole over the Antarctic this year has equaled the record-setting hole observed in 1987, NASA scientists said last week.

Dr. Arlin Krueger, Dr. Richard Stolarski and Dr. Mark Schoeberl of Goddard Space Flight Center have been closely monitoring ozone levels over the Southern Hemisphere with the Total Ozone Mapping Spectrometer (TOMS), an instrument on board NASA's NIMBUS-7 satellite.

Previous measurements had indicated this year's hole might be as severe as the 1987 hole, and a record low ozone level was reached on



NASA Illustration

The Galileo probe spacecraft's instrument descent module "hangs in the shrouds" in this artist's concept, making the first direct measurements of Jupiter's atmosphere. The red-hot nose cone can be seen falling away as lightning flashes nearby.

Jovian belt fades

Atmosphere changes as probe's journey begins

The planet Jupiter, scientific objective of this week's Galileo mission, has recently exhibited dramatic changes in a major atmospheric feature.

Complementary observations made at the NASA Infrared Telescope Facility on Mauna Kea, in Hawaii, and at the Tortugas Mountain Observatory near Las Cruces, N.M., show that the South Equatorial Belt, a dark feature circling Jupiter just north of the Great Red Spot, has faded out.

This change, which appears to involve mid-level clouds, occurred over a few months during the past summer. The corresponding North Equatorial Belt remains dark, and Jupiter's high cloud layer and stratosphere also appears unchanged.

The infrared observations were carried out by an International Jupiter Watch team organized by Dr. Glenn Orton, a planetary scientist at the Jet Propulsion

Laboratory (JPL) and a member of Project Galileo's science team, with the cooperation of many scientists.

Concurrent observations in visible (blue-green) light and in the near-infrared band associated with atmospheric methane were made by Dr. Reta Beebe, Scott Murrell and David Kuehn of New Mexico State University in Las Cruces. The university's 24-inch telescope at Tortugas Mountain was used with a JPL-provided CCD sensor. Beebe is a member of the Voyager imaging team.

The observations were a part of NASA's Planetary Astronomy Program, which carries out Earth-based research to complement the spacecraft-based exploration of the Solar System.

This brightening of normally dark belts has occurred at various Jovian latitudes at various times in the past, and many astronomers

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Atlantis roars upward; Galileo begins journey

By Kelly Humphries

The space shuttle *Atlantis* and its crew of five blasted into orbit Wednesday morning, and with the help of quake-affected colleagues started the Galileo probe on its way to Jupiter.

Atlantis lifted off at 11:53 a.m. CDT after being threatened by a court challenge, delayed five days by a suspect main engine controller and one day by unfavorable weather. Landing

is scheduled for 2:38 p.m. Monday. Blue skies and cotton-like clouds at Kennedy Space Center's Pad 39-B were the backdrop for a launch that had faced one last obstacle—a devastating earthquake on the other side of the continent—before coming to fruition.

Tuesday's San Francisco-area earthquake shook the inertial upper stage (IUS) control room at Sunnyvale, and for a time posed concerns that damage or the inability of controllers to get to work might postpone the launch again.

But after an evening of assessment, controllers at the Consolidated Space Test Center at Onizuka Air Force

Base indicated they were ready to support the mission.

The crew—Commander Don Williams, Pilot Mike McCulley and Mission Specialists Ellen Baker, Franklin Chang-Diaz and Shannon Lucid—deployed the Galileo spacecraft at 6:15 p.m. CDT. The spacecraft's IUS

first stage motor fired on schedule at 7:15 p.m. The second stage motor ignited 150 seconds after separation from

the first stage, and Galileo separated from the IUS at 8:05 p.m. beginning its five-year journey to the largest planet in our solar system.

"My colleagues out at Sunnyvale, California, did something very remarkable," Lead Flight Director Milt Heflin said Wednesday night following the Galileo deployment. "Those folks out there today were as good if not the best I've ever worked with."

"It was a great team effort between NASA and the Air Force," said Parker Counts, NASA program manager for the IUS.

Galileo will follow a Venus Earth Earth Gravity Assist (VEEGA) trajectory. Please see **ATLANTIS**, Page 4



STS-34

Galileo

Surgeons, crew members plan to consult routinely

By Pam Alloway

Medical consultations between astronauts in space and NASA physicians on Earth will become a routine part of space shuttle flights beginning with STS-34, helping to improve the understanding and provide timely treatment of initial space motion sickness symptoms.

A private medical communication will be scheduled between shuttle crew members and Mission Control Center flight surgeons during the pre-sleep periods on the first two days of each flight beginning with STS-34. Additional consultations may be requested by either the crew or the flight surgeons.

"The communication will assure the most effective treatment of space motion sickness symptoms during the first two days of flight when the condition is most prevalent," said Dr. Jeff Davis,

chief of Johnson Space Center's Medical Operations Branch.

"While symptoms vary from one person to another," Davis said, "most cases are mild and constitute little more than an inconvenience to the crew member. Given the variation in symptoms and available treatments, we felt it would be useful to plan routine consultations for the first two days of each mission."

The consultations will be confidential because of the physician-patient relationship and privacy laws. If a crew health problem is determined to affect a mission adversely, the flight surgeon will prepare a statement for public release which will address the nature, gravity and prognosis of the situation. Information beyond that required to understand mission impact will not be released.



Robert L. Forward

Interstellar travel: is it feasible today?

By Kelly Humphries

Rockets may be a feasible method of putting around the Solar System, but we'll have to do better if we want to reach our nearest stellar neighbor within a human lifetime. And according to one physicist, that technology already exists.

Dr. Robert L. Forward—physicist, science consultant and author of fact and fiction—says alternative technologies are sophisticated enough to return high-resolution television pictures from the nearest stars within 25 years.

"Going to the stars is difficult, but it's not impossible," says Forward, who has 35 years experience in advanced space propulsion, experimental general relativity, gravitational and inertial sensors, low noise electronics and space sciences.

He'll air his theories on "The Feasibility of Interstellar Flight" at Thursday night's American Institute of Aeronautics and Astronautics dinner meeting at 7:30 p.m. in the Gilruth Recreation Center ballroom.

The first step, he says, could be his own "Starwisp," a 20-gram unmanned probe nestled in a wire mesh sail and powered by

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JSC

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Gift Store from 10 a.m. to 2 p.m. weekdays.

General Cinema (valid for one year): \$3.50 each.
 AMC Theater (valid until May 1990): \$3 each.
 Astroworld (last month): half-off coupons.
 Sea World (San Antonio, year long): adults, \$17.25; children \$14.75.
 Texas Renaissance Festival (open weekends Sept. 30-Nov. 12): adults, \$8.95; children \$4.95.
 Halloween Dance (Oct. 28, 7 p.m., Gilruth Recreation Center): \$11/person.
 20th Anniversary of the First Lunar Landing Speakers Program Videos are available in the Bldg. 11 Exchange Store.

JSC

Gilruth Center News

Sign up policy—All classes and athletic activities are first come, first served. To enroll, you must sign up in person at the Gilruth Recreation Center. Everyone will be required to show a badge or EAA membership card. Payment must be made in full at the time of registration. Classes tend to fill up four weeks in advance.

EAA badges—Dependents and spouses may apply for a photo I.D. 6:30-9:30 p.m. Monday-Friday.

Defensive driving—Course is offered from 8 a.m.-5 p.m., Nov. 18 and Dec. 16; cost is \$15.

Weight safety—Required for use of the Rec Center weight room. Classes will be 8-9:30 p.m. Oct. 25, Nov. 7 and Nov. 29; cost is \$4.

Aerobics and exercise—Both classes are ongoing; cost is \$24.

Ballroom dance—Professional instruction in beginning, intermediate, and advanced ballroom dancing. Classes are on Thursdays, 7-8:15 p.m. for beginning and advanced and 8:15-9:30 p.m. for intermediate, eight-week course is \$60 per couple.

Intercenter run—The 10-kilometer and 2-mile races for the annual Fall Intercenter Run will be held throughout October. Runners may submit their times at the Rec Center.

October softball tournament—A men's open "C" softball tournament will be held at the Rec Center Oct. 28-29. Limited to 12 teams; entry fee is \$95. Deadline is 6 p.m. Oct. 26.

Country and western dance—Lessons begin Nov. 6 and held every Monday for six weeks; cost is \$20 per couple.

Beginning tennis lessons—Lessons begin Nov. 6 and are held each Monday for six weeks, 5:15-6:45 p.m.; cost is \$32. Sign-ups begin immediately.

JSC

Property

Sale: Seabrook lots, 150 ft. off water on Toddville, ex. homesteads and investment, owner finance. 474-5558

Sale: Kirkwood South, custom built 2-story, 2400 sq. ft., 4-2 1/2-2, formals, FR, FPL, stury, ex. cond. large cul-de-sac lot, \$79,900. 488-5210.

Sale: Heritage Park, 3-2-2 home, freshly painted, ext. spa, lg. deck, FPL, Stainmaster carpet, 10.5% assum., near pool, tennis courts, and elem. school, \$69,500. 996-0289.

Sale: Seabrook, 3-2-2, new A/C, heater, carpet, ceramic and quarry tile, many upgrades, approx. 1800 SF, all brick, both formals, lg. den w/FPL, never flooded, redwood deck w/spa, \$69,900, assume at 9%, must qualify, \$0 down. Richard, x30271 or 474-9334.

Sale: Pearland, 4-2-5-2 two-story home on lg-dry lot, centrally located, 9% assum. FHA loan, window covering throughout, formals, sprinkler system, ex. neighborhood. 997-1824.

Sale: League City, 2.06 acres, near schools, 15 min. from NASA, city water & sewer avail., \$39,950. 554-6695.

Sale: League City Newport, 3-2-2 home, new roof, new A/C, freshly painted ext., FPL, ceiling fan. 488-6306.

Sale: Seabrook, 3.29 acres w/small 2 BR/1B home, 3 miles from NASA, quiet, secluded, \$95,000. 532-4784.

Sale or Lease: 10 acres 1/2 mile west of Hwy 146 on FM 517, barn (40x60), ponds (stocked), util. Trey, 280-4381 or 484-7834.

Lease: Heritage Park, new home 4-2 1/2-2, formals 2500 sq. ft., fenced, \$925/mo. + \$925 dep. x39863 or 996-8536.

Lease: Piper's Meadow, immac. 3-2-2A, FPL, drapes, fenced, all new paint & carpets, sitting room, \$750/mo. 486-0315.

Rent: Baycliff, mobile home lot, 4421 4th St. & 4102 Kinne, \$85/mo. + \$50 dep. 488-1758.

Rent: Spend Christmas week in Puerto Vallarta, fully furn. timeshare condo, \$325/wk. 283-5633 or 480-3859.

Rent: Lake Travis cabin, private boat dock, central A/C & heat, fully equip. accom. 8, \$325/wk. \$75/day. 326-5652.

Rent or Sale: Crystal Beach cabin, 2BR/1B, A/C close to beach, \$325/wk. + \$200 dep., or sale \$32,000. (409) 832-2582 or (409) 755-1638.

Rent: Pagosa Springs, CO, 2 BR house unit, sleeps 8, near Wolf Creek/Purgatory, 7 days, pick wk (Sat to Sat), before 23 Dec 89, \$270. 6 Jan - 26 May 90, \$550. x34614 or 334-2278.

Horse pasture for rent, 2 stalls, \$30 ea. Full board avail. Friendswood area. 482-8647.

Trade houses: Custom canyon view 4-3 off 360 West of Austin. Prefer 5 yr. old open plan within 20 min. of JSC. 471-8795 or 333-6083.

Cars & Trucks

'29 Mercedes Replicar, still in kit form, Ford frame, \$5500. Trey, 280-4381 or 484-7834.

'84 Chevy Celebrity, 4-dr, auto., A/C, PW, PL, cruise, tilt wheel, delux cloth upholstery, reclin. bucket seats, AM/FM/cass., metallic brown, \$4000. Edward, x36250 or 481-4889.

'88 Taurus sedan, burgundy, 6 cyl., PW, PS, PL, moon/sun roof, oversized trunk, extras, 22K mi., was \$15.5K now \$11K OBO. 332-1553.

'80 Dodge D50 PU, new paint, A/C, 5-spd., stereo radio, bucket seats. Herman, 283-2885.

'87 Audi Coupe GT, special build, tornado red, blk full leather interior, 29K mi., \$11,500. Mike, x36632 or 332-4074.

'80 Corvette Coupe, 65K miles, ex. cond., matching no., all power, shop manual, \$8400 OBO. x34600 or (409) 345-4597.

'72 Fiat Spyder convert., blue, int. & ext. ex. cond., runs great. 488-2941.

'84 Honda Civic 4-dr. sedan, auto., A/C, AM/FM/cass. stereo, tinted windows, tilt steering, ex.

cond., \$4850. 282-3216 or 334-2335.

'88 Ford Mustang LX convert., loaded, leather bucket seats, immac. cond., take over notes. x35786 or 486-6125.

'86 Plymouth Reliant, loaded, 41K mi., lt. blue. 482-6187.

'85 Cordia-Mitsubishi Turbo, 5-spd., cruise cont., tilt steering, AM/FM/cass., sunroof, dgli. clock, cloth int., 2-dr hatchback, tinted windows, \$3990 OBO. Deborah, x31299 or 333-1073.

'79 Chevy Malibu-Classic, very good cond., \$1200. Earl Rubenstein, x34807 or 326-2354.

'82 Ford Fairmont, 4-dr., A/C, good cond., 70K mi., service manuals, \$1900 OBO. 482-6187.

'75 Ford F-100 PU, 302 auto, PS, PB, new seat cover, mufflers, tire, radio, runs good, \$750. 333-6558 or 339-1337.

'73 Olds Cutlass Supreme 2-dr., engine runs good, body needs work, \$500. Donna, 488-9005.

'68 Chevy Impala, runs, \$200 OBO. x38160 or 482-8411.

'85 Mitsubishi Tredia, 4-dr., 5-spd., A/C, AM/FM/cass., 70K mi. Bob, x32350 or 331-5069.

'76 Celica GT, new motor, trans., rear end, center line mags, front suspension and brakes, needs paint and interior, \$1800. 480-5426.

'85 Jaguar XJS, ex. cond., 45K mi., \$21,750. Earl Rubenstein, x32972 or 326-2354.

'85 Red standard Corvette, loaded, two tops, extras. 334-3836.

'82 Porsche 924 Turbo, ex. cond., loaded, 55K mi., sunroof, leather int., digital Blaupunkt w/amp, tint, \$8800. x24857 or 486-4940.

Boats & Planes

16' Falcon, deep-V, 40hp Johnson, Sportsman trailer, runs great, \$1250. x30878 or 996-6418.

Sunfish sailboat and double trlr., \$1000. M. Jones, x38278 or 326-2995.

14' Glassmagik skiboat, 80hp Mercury, galv. trlr., skis, fresh water use, ex. cond., 38 mph, \$1795. x35180 or 326-3706.

'74 Stevry boat, trihull fiberglass, split windshield w/'74 Chrysler outboard 135hp motor and '76 Shoreline trlr., tilt, wench, buddy bearings, \$2000. x33100 or 337-4803.

Mercury outboard, 20hp, good running cond., \$500 OBO. 480-5997.

16' Snipe day-sailer & trlr., no sail, fair cond., \$250. 333-6594 or 333-3725.

'84 20.5' Rinker, 170hp OMC I/O, cuddly cabin, full electronics, outriggers, all Coast Guard equip., w/tandem axel trlr., \$8,700. x35178 or 994-2391.

17' ABS canoe w/kneeling pads and thigh straps, \$450 OBO. 488-1257.

27' Santana sailboat, 5 sails, VHF radio & depth finder, \$5500. x36875 or 482-9450.

'70 18' tri-hull, 135hp Mercury outboard and galv. trlr., needs work, \$1000 OBO. 481-6396.

14' Glassmagik skiboat, 80hp Mercury, galv. trlr., skis, fresh water use, ex. cond., 38 mph, \$1795. x36180 or 326-3706.

Cycles

'84 Honda V-65 Magna, black, 10K mi., \$1800. Paul, 282-4098 or 554-6366.

3 motorcycle Sunco trlr., large tool box attached, ex. cond., \$395. 333-6594 or 333-3725.

Honda 350, 5.5K mi., ex. cond., \$675. Danny, x36578 or 455-7322.

Dingo 8hp Go-Cart, good cond., \$450 OBO. x30577 or 554-2375.

'78 Kawasaki KZ650, quicksilver fairing, other extras, ex. cond., 5.5K mi., \$750. x30577 or 554-2375.

'85 Suzuki Madura 700cc, 19K mi., show room cond., \$2500 OBO. 538-1479.

Audiovisual & Computers

Casio FX-800G graphics computer, 1446 prog. steps, 1917 file steps, 8 line x 16 char. display, interface w/storage & printer, \$7500.

Today

Galileo overview—The Houston Space Society will sponsor a program entitled, "Galileo: A Closer Look at Jupiter," at 7:30 p.m. Oct. 20 in the Atlantic Room, University Underground, University of Houston. Debbie Jackson, a JSC flight activities officer, will discuss the upcoming mission. For more information, call 520-6924.

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

Monday

Cafeteria menu—Special: beef and macaroni. Entrees: ham steak, Parmesan steak. Soup: chicken and rice. Vegetables: green beans, carrots, au gratin potatoes.

Tuesday

BAPCO meets—The Bay Area PC Users Group (BAPCO) will meet at 7:30 p.m. Oct. 24 at the League City Bank and Trust. Contact Earl Rubenstein at x34807 or 326-2354, or Ron Waldbillig at 337-5074 for information.

Cafeteria menu—Special: Mexican dinner. Entrees: potato baked chicken, barbecue spare ribs. Soup: tomato. Vegetables: squash, ranch beans, Spanish rice, broccoli.

Wednesday

Astronomy seminar—The next JSC Astronomy seminar will be an open discussion meeting from noon-1 p.m. Oct. 25 in Bldg. 31 Rm. 193. For details, call Al Jackson, x33709.

Cafeteria menu—Special: baked meatloaf with Creole sauce. Entrees: baked scrod, liver and onions, ham steak. Soup: seafood gumbo. Vegetables: beets, Brussels sprouts, green beans, whipped potatoes.

Thursday

AIAA meeting—The next American Institute of Aeronautics and Astronautics (AIAA) dinner meeting will be at 6:30 p.m. Oct. 26 in the Gilruth Recreation Center. Robert L. Forward, a science consultant and writer, will speak on the feasibility of interstellar flight. For more information, call Sarwar Naqui at 282-2767.

Cafeteria menu—Special: smothered steak with dressing. Entrees: chicken and dumplings, corned beef with cabbage. Soup: beef and barley. Vegetables: spinach, cabbage, cauliflower au gratin, parsley potatoes.

Oct. 27

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

Oct. 31

Nominations due—The deadline for the next quarterly JSC Quality Partnership Award has been extended to Oct. 31, 1989. The award recognizes civil servants and contractors not in the quality field for contributions toward higher standards of quality at JSC. Nominations should be sent to H.T. Briggs, Code ND.

Quality, productivity conference—The sixth annual NASA/Contractors Conference on Quality and Productivity will be Oct. 31-Nov. 1 at the Von Braun Civic Center in Huntsville, Ala. This year's theme is "Partnership for Continuous Improvement." NASA Administrator Richard Truly is to announce the 1988/89 NASA Excellence Award for Quality and Productivity.

Nov. 6

Supercomputing symposium—"Supercomputing: Parallel and Numerically Intensive Computing" will be the focus of the next Research Institute for Computing and Information Systems (RICIS) series Nov. 6-7 at the South Shore Harbour Hotel and Convention Center. Co-sponsored by RICIS and JSC. Sessions will consider supercomputer design; major issues of supercomputing; innovative computing and experimental architectures; image processing, graphics and simulation; and computational fluid dynamics. NASA employees should contact Glen Van Zandt, x33069.

Swap Shop

Tom Clark, x9842.

Car stereo, Realistic 40 watt equalizer, \$20; Realistic power booster, \$5; two TS-87 Pioneer spkrs, 3 1/2 in., \$15. Rick, 996-8961 or 280-1500.

Sears AM/FM/8 track stereo, model 257, \$100. Bauch, 333-3382.

Zenith 386 16MHz workstation, w/387 coprocessor, 40 HD, 1.2 5 1/4 FD, Zenith 1490 flat screen color monitor, VGA graphics, game card, flight stick joy stick, DOS 3.21, MS Windows, games, all manuals, was \$8K now \$5K. Kelly, 280-1500 x3381 or 532-2258.

ALTEC Lansing model 14 studio monitor loudspeaker system, high effic. rated, hi fi circuit protected, amp. dependent, 5 to 200+ watts rms, \$300 ea. 997-1824.

AT, EGA, 512K RAM, 12MHz HD, 360K floppy, 1200 baud modem and new computer desk, \$1100. 483-4701 or 280-8788.

Apple IIc, full system w/o printer, has mouse & ext. drive, 128K. S/W assort., \$850. 538-1479.

Household

Pine Country-style LR set, couch (needs work), chair, rocking chair, ottoman/coffee table combo, orange/green on cream, \$100 OBO. Donna 488-9005.

Olive green sofa, infrequently used, \$75. John Dornbach, 326-3459.

Very large set of Amber Sharon Cabbage Rose depression glass, collectors item, ex. cond., will sell pieces, BO. Alison, x34314 or 332-0298.

Brown color couch, suede-like fabric, good cond., \$35 OBO. Eeveen, 282-3477.

Bassett full size bed, w/frame, plastic & quilted mat covers, ex. firm, \$175. x38889 or 480-1340.

Queen size waterbed, 90% motionless w/heater & 6-drawer pedestal, light bridge, center mirror, 6 drawers per side plus storage at head and above drawers, 1 yr. old, was \$3000 now \$1800 OBO. 332-1553.

Grey sofa, loveseat, chair, coffee table, 2 end tables & 2 grey lamps, \$250. x34229 or 640-1487.

Dining table, 1/2"-thick glass top, brass base; 6 chairs w/brown uphol. seats, inset cane backs; like new, \$300. Anne, x34493 or 996-1287.

Couch & chair set, tapestry floral print, good cond., \$150; Hallet, Davis & Co. upright piano, need tuning, \$85. 332-9231.

Three Sears Kirsch double traverse curtain rods, were \$210 now \$15 ea.; curtains, were \$46 now \$10 per panel. Bauch, 333-3382.

'40 vintage armoire, 5 drawers, 2 doors, beveled mirror, \$150. 470-8881.

Sectional sofa, 1 yr. old, steel blue w/recliners on each end, was \$1250 now \$800; 2 matching gold/yellow chairs, \$60 for both. Danna, 996-9943.

Early American couch, plastic, \$80. Ed, x36250.

King size waterbed, blk laq., ex. cond., 1 yr. old, \$250; gray contemp. loveseat, \$50. 488-3330.

Child's 27" round, solid maple table, w/2 spindle-backed chairs, hand finished w/tough polyurethane, \$95; matching child's rocking chair, \$40; both like new. x35137.

Breakfast set, oval table w/2 chairs, \$25. 283-5633 or 480-3859.

Polished hardwood dining table, hexagonal top, curved legs, ex. leaf, game table height, \$200. Bob, 484-0898.

All white wicker items: dressing table/mirror/chair, \$250; twin headboard and rails, \$75; night stand, \$50; occasional chair, \$80, \$375 for all. 996-9416.

King size Mediterranean style bed, BO, or trade for sleep sofa. Claire, x34828 or 337-2415.

G.E. built-in double oven, ex. cond.; 1 new Levolor mini blind, size 82" by 36", alabaster. 488-2822.

Corvette silk 15" pillow, \$12; solid brass 10" windsurfer, \$15. Steve, 486-8716.

30"x30" mirror, \$10. Joan, x36516 or 941-5908.

Cherry-wood, Chippendale-style curio table, lift-up glass top, glass sides, lined in stain-resistant velvet, 20 1/4"x18"x13", was \$150 now \$95. Charlotte, x36258.

Queen size sofa/sleeper, avacado and gold velvet, ex. cond., \$300; room size (11x11) carpet, brown tones, \$20. 482-1535.

15x16 rug, orange-red earth tones, good cond., \$75. Paul, x37736.

Queen size sofa bed, brown plaid, ex. cond., \$100; off white swivel chair, \$50. 486-0297.

Chromcraft dinnet set, modern., executive walnut table, 4 diamond tufted blk vinyl chairs, \$220. Boyd, 488-8806.

Double sofa bed, off-white tweed, good cond., \$75. x36015.

Photographic

New Nishika 3-D camera, uses regular 35mm film, camera only, \$300; w/accessories \$400. Laurie, 326-1930.

Pets & Livestock

Saltwater fish, coral beauty, \$5; 55 gal. aquarium set-up for saltwater or freshwater w/stand, \$200. Forest, x35178 or 944-2391.

Wanted

Yamaha jog scooter, 1989 preferred, also scooter tires 2.75-10-4PR. Fred, 488-8111 or 944-0493.

'82-'88 Camaro Z28 V8 (305 or 350) engine, must be complete w/brackets & sensors, intake heads are main concern, 5.0 high output 305 preferred. Phillip, \$37260 or 480-7129.

Need carpool rider from hwy 6 and 290 area or West Little York Park & Ride to JSC, work hours 7:30 a.m. to 4 p.m. Bill, x34936.

Want to join or form carpool from the Montrose-Rice area. Hours are 7:30 to 4:30. Mary, x34802 or 528-4675.

Nanny needed, mature, loving, nonsmoker to care for 2 preschoolers and 1 afterschooler in my League City home, references. 332-9286.

Riders needed, vanpool West Loop Park & Ride to NASA. Richard, x37557.

Wanted, four wheels for Boy Scout (Webelos) pushmobile project, diam. including tires must not exceed 16", prefer 12"-16". 326-2187.

Want to buy a "Binks" paint spray gun. Herman, 282-2885.

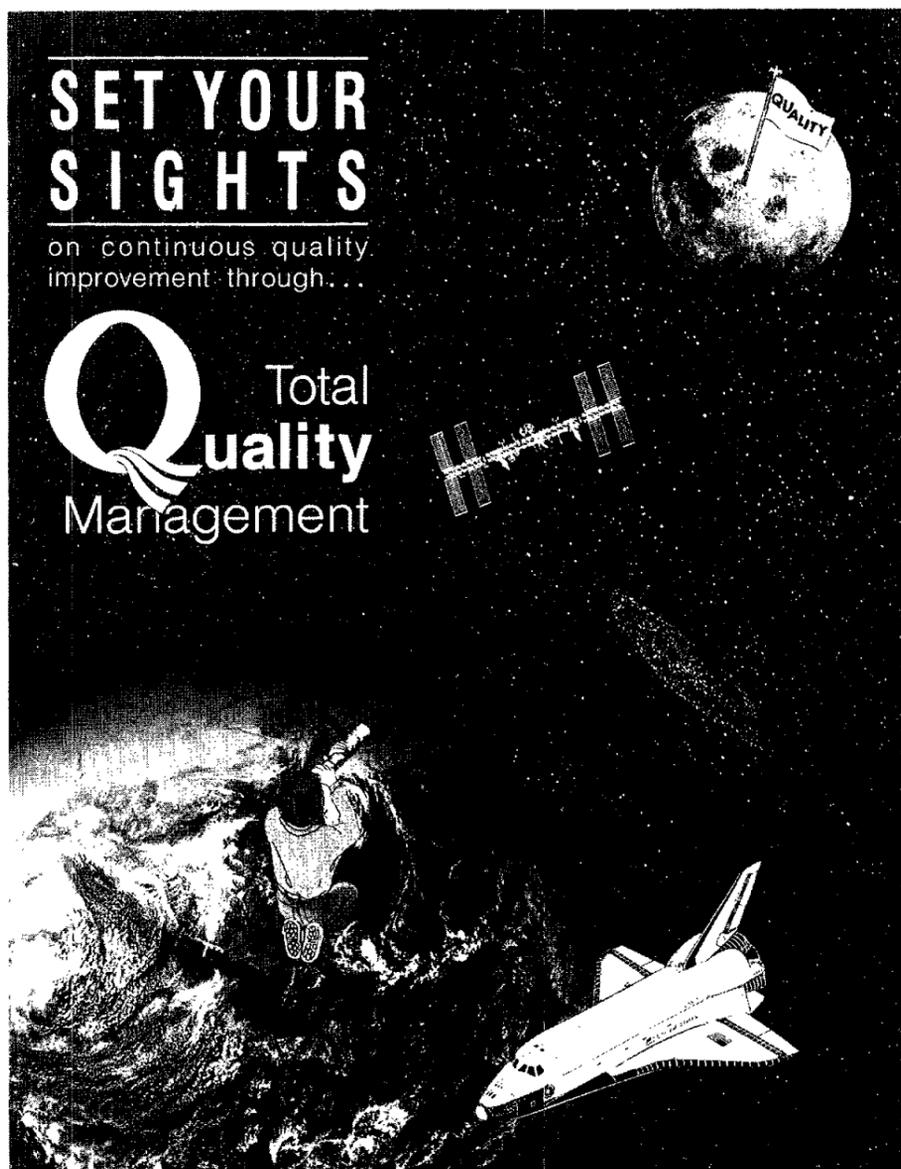
Want washer and dryer in ex. running cond., color not important. Judy x31260 or 488-2941.

Want boat trailer, any size, any cond. Randy, 282-4857 or 486-4940.

Good used lawnmower, elec. or gas. Tony, x35966.

Female non-smoker looking for same to rent furn. BR/private bath in Clear Lake home w/ W/D, FP, rose garden, lots of windows, swimming pool, tennis courts etc. nearby, \$250/mo., util. nego. 486-6988.

'Quality is a responsibility we all share, and as far as I am concerned it is an obligation that goes with taking a paycheck.'



Quality means doing it right the first time

By Charles Harlan

Director of Safety, Reliability and Quality Assurance

Beginning in 1988, October became "Quality Month" in NASA. I really have mixed feelings about this, as those of us who consider ourselves to be professionals in the field want the emphasis on quality to remain high every day of the year.

On the other hand, Quality Month presents the opportunity to give some special emphasis to the subject and I'll not let that pass by without a try.

Quality is your job

Let me offer the premise that quality is just as much your job as it is mine, maybe even more. One of the reasons that I am so proud to work for NASA is the excellent reputation that we have in being a quality outfit. I think that most of us get good strokes from the outside world when people know we work for NASA, an outfit that has a reputation for being top caliber.

Stepping beyond that good feeling we get, it is clear when you look objectively at our real performance that there is still much room for improvement.

This fallacy exists when we measure ourselves just by our successes and not by our total effort. It is enjoyable and even proper for us to bask in the exuberance of a mission that has been completed successfully.

Not just an audit

Reality, however says that often we got there by a torturous trail of nonconformances, material review actions, discrepancy reports, scrapped hardware and material, and rework. Accompanying that was a large amount of precious engineering time devoted to fixing

problems or finding rationale to continue when something failed to meet requirements. We seem to have become accustomed to this mode of operations and have built in the mechanisms and relief valves that allow it to happen.

There is a common misconception held by many in the aerospace business that the term "quality" applies principally to the manufacturing process, and that it is an audit performed by the quality assurance arm of the organization. By and large we too often implement our quality programs in this manner. Quality then becomes something that the other person does to check our work.

Example on STS-34

I will cite an example from the STS-34 L minus 2 day review held on October 10, 1989. There were 3 or 4 cases of nonconformances discovered during the planned testing on the STS-34 stack. Found between the Flight Readiness Review and the Oct. 10 meeting, which were just a week apart, they were attributed to erroneous engineering.

Parts were installed just as called out on a drawing and were verified and stamped off by inspection, yet when tested the installation failed to function properly. It was a clear case of the error

being in the engineering process rather than in manufacturing.

There are other numerous examples of rather serious nonconformances that have happened since our return to flight that have been caused by other than workmanship on the hardware. Of course we have also had our share of problems caused by poor workmanship.

Fortunately, we find most of them and they are fixed before we fly. We can all do more to help avoid this type of situation.

Doing things right everytime

You can see that there is ample opportunity for each one of us to make a rather significant contribution to the success of our projects by making sure that we are doing things right every time. Quality is a responsibility we all share, and as far as I am concerned it is an obligation that goes with taking a paycheck. Please think about your job and how you can improve what you are doing to strive for an error-free environment. If we can work together and reduce the nonconformance rate significantly we will all benefit.

Error-free environment

A couple of thoughts that will help you with this:

- 1) develop a way to measure and track the errors that happen in your work processes, and
- 2) single out the categories of errors that are the most repetitive and concentrate your energies on taking corrective action that will prevent their recurrence.

As for the programs we work on, they will be safer, cheaper, more reliable, and will come closer to meeting their objectives.

What have you done today to prevent errors?

Quality award nominations due

The deadline for nominations for the quarterly JSC Quality Partnership Award has been extended until October 31, 1989.

Nominees should be individuals or small teams not professionally active in the fields of safety, reliability, and quality assurance.

The award recognizes civil service and contractor personnel in the JSC area for contributions toward better effectiveness and higher standards of quality of products, processes, and services.

Nominations should include the name of the individual, a brief biographical sketch, and a brief summary listing the areas of outstanding contributions to quality. Quantitative data measuring of the achievement is desirable, as well as the name, address, and phone number of the nominator. Nominations should be sent to H. T. Briggs, Technical Assistant, Quality Assurance and Engineering Division, Code ND.

The fourth Quality Partnership Award was presented in August to Art L. Bynam, group supervisor of Rockwell's magnetic tape cleaning/certification facility, by JSC Acting Center Director Paul Weitz.

Common plants may help fight indoor air pollution

Common indoor plants may provide a valuable weapon in the fight against rising levels of indoor air pollution, based on research conducted by NASA.

NASA and the Associated Landscape Contractors of America (ALCA) recently announced the findings of a two-year study that suggests the common indoor plant may provide a natural way of combating "sick building" syndrome—an acute incidence of indoor air pollution

that can occur in closed or poorly ventilated offices and residences.

Research into the use of biological processes, as a means of solving environmental problems both on Earth and in space habitats, has been carried out for many years by Dr. Bill Wolverton, a senior research scientist at Stennis Space Center.

Based on preliminary evaluations of the use of common indoor plants for indoor air purification and revitalization, ALCA joined NASA to fund

a study of about a dozen popular varieties of ornamental plants.

While more research is needed, Wolverton says the study has shown that common landscaping plants can remove certain pollutants from the indoor environment.

Each plant type was placed in sealed, plexiglass chambers in which chemicals were injected. Philodendron, spider plant and the golden pothos were labeled as the most effective in removing formaldehyde.

Flowering plants such as the gerbera daisy and chrysanthemums were rated superior in removing benzene from the chamber atmosphere.

Other plants demonstrated to be effective air purifiers include the bamboo palm, peace lily, ficus, mass cane, mother-in-law's tongue, English ivy and Chinese evergreen.

"Plants take substances out of the air through the tiny openings in their leaves," Wolverton said. "But research in our laboratories has

determined that plant leaves, roots and soil bacteria are all important in removing trace levels of toxic vapors."

"Combining nature with technology can increase the effectiveness of plants in removing air pollutants," he said. A living air cleaner is created by combining activated carbon and a fan with a potted plant. "The roots of the plant grow right into the carbon and slowly degrade the chemicals absorbed there," Wolverton explains.

Atlantis launch 'good looking'

(Continued from Page 1)

that builds its velocity and takes it through the asteroid belt to Jupiter. There, it will separate into two spacecraft, one that will descend into the Jovian atmosphere and another that will relay the probe's data to Earth and make close inspections of Jupiter and four of its moons.

Shortly after *Atlantis* achieved orbit, its flash evaporator system (FES) automatically switched from its normal low-cooling mode to the high-load subsystem, giving controllers and the crew something to monitor closely. The FES switched over normally to the payload bay radiators when the payload bay doors were opened, however, and the anomaly was not expected to adversely affect the mission.

Also during flight day one, the crew turned on the Shuttle Solar Backscatter Ultra Violet (SSBUV) instruments and the Polymer Morphology (PM) experiment. The SSBUV is designed to calibrate similar ozone measuring space-based instruments on the National Oceanic and Atmospheric Administration's TIROS satellite. The PM experiment developed by 3M is an organic materials processing experiment designed to explore the effects of microgravity on polymeric materials as they are processed in space.

The crew was scheduled to activate the Shuttle Student Involvement Program (SSIP) experiment involving ice crystal growth in microgravity, the Mesoscale Lightning Experiment (MLE) later in the mission, and to perform several Development Test Objectives and Detailed Supplementary Objectives throughout the mission.

Ozone hole equals record of year ago

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per day. In contrast, ozone decreased by only 15 percent in September last year, when the ozone hole was relatively weak.

Schoeberl reported that in August and September the polar vortex was extremely cold and undisturbed. According to current theory of the ozone hole, these are the ideal conditions for the formation of the polar stratospheric clouds that lead to ozone depletion.

The NIMBUS-7 TOMS instrument has been measuring stratospheric ozone for more than 10 years as part of the Earth Science program managed by NASA's Office of Space Science and Applications. To support Antarctic scientists, Goddard has been processing the data from TOMS in near real-time and observations are transmitted to researchers around the world.

Promotions in shuttle program

(Continued from Page 1)

Aldrich has been associated with the U.S. manned space program almost since its inception, joining the NASA Space Task Group, the forerunner of NASA's Manned Spacecraft Center (now JSC) in 1959 after graduation from Northeastern University. From 1966 to 1975, he held increasingly responsible positions in the Apollo program.

In 1975, Aldrich joined the space shuttle program office where he managed various aspects of the program until his appointment as overall shuttle program manager in 1985. In November 1986, he became NSTS director.

Crippen, a native Texan and a



JSC Photo by Jack Jacob

Andrew "Pat" Patnesky ends up on the other side of the camera as JSC Acting Director P.J. Weitz presents him with a Silver Snoopy Award recognizing his many years of mission support through photography.

'Pat' Patnesky marks 50 years of photos

By Kelly Humphries

When cows roamed the pastures that have become JSC, Andrew "Pat" Patnesky spent a full hour waiting for them to look into the camera lens for a now-famous photograph.

That was almost 30 years ago, but even then Patnesky was a 20-year veteran of government service.

This month, on Oct. 10, Patnesky celebrated a rare anniversary, that of his 50th year of government service. He received a Silver Snoopy Award from the JSC astronaut corps he helped chronicle since day one, a special plaque from the government and the congratulations of his friends and co-workers in the Public Affairs Office Media Services Branch.

His response to all the attention: "I'm just gettin' warmed up."

Patnesky, 69, began his long career by voluntarily joining the U.S. Army Air Corps in 1939. An aerial and ground photographer, he took reconnaissance pictures for bombing runs aboard B-24s during World War II. He also went to flying school in 1942, but

piloting turned out not to be in his future.

He was the photo lab chief at Ellington Air Force Base from 1952 to 1960, when he retired from the Air Force. He remained at Ellington as a civil servant and continued as photo lab chief until 1961.

That's when he joined the Manned Spacecraft Center's Public Affairs Office and began taking photos of rickety buildings, cows and astronauts.

His favorite photograph: the one of the original seven Mercury astronauts wearing cowboy hats upon their welcome to Houston. His most memorable experience in government service: the 21 days in 1941 he spent in a Navy PB5 above the Arctic Circle photographing potential Distant Early Warning system sites. His most rewarding association: "working with the astronauts because they're fine people to me."

Despite his long career, Patnesky isn't yet ready to quit.

"I go day by day," he says. "I have no plans to retire because I love what I do."

Tutoring pool begins

The JSC Chapter of the Prairie View A&M University Alumni has initiated, through its Education Committee, a mentor/tutor resource pool.

Sixteen JSC employees, including engineers and scientists from NASA, Rockwell, McDonnell Douglas, and Unisys, have volunteered to spend a minimum of two Saturday morning hours per month on assisting mathematics or English middle school instructors with their remedial classes.

"It's easy to be aloof and uninvolved in helping to solve the problem of youth who are less than motivated and have a low sense of self-esteem," says Ervin Grice, data analyst, Software Technology Branch. Grice, who co-chairs the alumni education committee with McDonnell Douglas' Victor Holloman, says the objective of the pilot mentor/tutor

program is to be a positive factor in improving the motivation of the youngsters.

The volunteers met yesterday with Houston Independent School District representatives to learn the name of the school they will be helping for the entire school year. They make their first appearance in the classroom Oct. 28.

"The alumni group felt this activity would give us a sense of satisfaction by helping with some of the problems educators face in our community," Grice said. "And we hope this positive action will also help modify the uninvolved image the middle class may have among these kids."

For more information about the program or the Prairie View alumni group, contact Grice at x38082, or Holloman, at 283-4106.

Welcome ceremony planned

Employees are invited to a welcome home ceremony for the crew and families of STS-34 at Ellington Field.

The ceremony will begin about seven hours after landing at Edwards Air Force Base. Currently, the landing is scheduled for 2:38 p.m. CDT Oct. 23 and the ceremony would begin at approximately 9:38 p.m. CDT.

The Clear Lake High School band plans to perform at the ceremony.

The ceremony will take place east of Hangar 990. Parking will be available on the west side of the hangar and gates will open one hour before crew arrival.

Updates on landing and return-to-Houston information will be available on the Employee Information Service, x36765.

Jovian atmosphere changing

(Continued from Page 4)

have observed it in visible light.

The South Equatorial Belt faded in the early 1970s, when Pioneer 10 and 11 flew by Jupiter, but turned dark again in 1974 and remained so through both Voyager encounters and until April 1989, according to Dr. Orton.

"This is the first time we have been able to correlate thermal infrared, methane-band and visible-light

images of the change, and over so large a region," he said.

The Galileo mission is designed to study Jupiter's atmosphere in many ways. Galileo's atmospheric probe will descend slowly through the cloud layers in December 1995. The Galileo orbiter, after observing Jupiter for months as it approaches, will study the planet in many wavelengths from ultraviolet to infrared and radio bands during a 1995-1997 orbital tour.

Travel to stars feasible

(Continued from Page 1)

microwaves beamed from a solar-powered satellite in Earth orbit. The vehicle would reach 20 percent of the speed of light within a week and reach Alpha Centauri in 21 years. The first data from another star would reach Earth four years later, he says.

The next step could be a manned mission using a laser-pushed light-sail 1,000-kilometers across. It would make a 50-year-long round trip to Epsilon Eridani, 11 light years away, or Tau Ceti, 12 light years away, at between 20 and 50 percent of the speed of light.

Forward—who built the world's first bar antenna for the detection of gravitational radiation, worked for Hughes Aircraft Research Laboratories for 31 years and holds 18 patents—says he's not trying to promote his own vision of interstellar flight. Rather, he wants to encourage

the scientists and engineers working on contemporary propulsion technology to start looking toward the stars, too.

"I know of at least one way to get to the stars," he says. "There ought to be better ways and I'd like the members of the audience to come up with them."

Forward says he "dreamed up" the manned craft concept for one of his fiction novels. As he worked with the numbers to determine where he would have to fool his more knowledgeable readers, he discovered he didn't have to fool them. The numbers worked, he says, and the craft could be built within 50 years from now.

"Most people put it in the category that it's impossible, pure science fiction," he says. "My contention is that it is no longer impossible, it is something engineers can contemplate and design."

Astronaut memorial to be built

Groundbreaking ceremonies for a memorial to 14 American astronauts who have been killed in flight or in training for space flight were held in Florida on Oct. 11.

The \$5 million project of The Astronauts Memorial Foundation should be completed in a year, according to Benjamin Everidge, president.

The project, called the "Space

Mirror" by designers, will be a 43 and 1/2-foot high by 50-foot wide memorial of polished granite.

Family members of each of the astronauts to be honored—including the crew members of the STS-51L shuttle mission, the crew of Apollo 1, and four astronauts killed in aircraft accidents while training—were introduced at the ceremony.

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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Associate Editor..... Linda Copley

graduate of the University of Texas, is a former Navy carrier pilot and became a NASA astronaut in 1969. He was in the astronaut support crew for the Skylab 2, 3 and 4 missions as well as the Apollo-Soyuz Test Project. Crippen has the distinction of having flown on a record four shuttle missions, having served as pilot of the first shuttle flight in April 1981 and commander of three subsequent missions in June 1983 and April and October 1984.

Shaw, an Air Force colonel, was selected as an astronaut in January 1978. He was pilot on STS-9 in November 1983, and commander of STS-61B in November 1985 and STS-28 in August.