



Year in Review Take a look back at the memorable

events of the past year at JSC. Photos on Page 3.



Speaking out

Local students win college money during NMA speech contest. Story on

Space News Roundup

Panel review finds space shuttle safe

The Aerospace Safety Advisory Panel concluded after a six-month review that efforts to streamline the Space Shuttle Program have not increased risks, the panel reported in December.

The review was requested on behalf of the President by the Office of Science and Technology Policy. The panel was tasked to review the issues associated with the safe operation and management of the space shuttle program arising from ongoing efforts to improve and streamline operations. These efforts include the transition to a comprehensive space flight operations contract, downsizing the shuttle workforce and reducing costs of operations and management. The study teams collected information through briefings, interviews, telephone conversations and from reviewing applicable documentation.

"I'm very pleased that the panel has given the Space Shuttle Program a clean bill of health," said NASA Administrator Daniel S. Goldin, "But the panel also pointed out some areas for continuing emphasis and the need to improve. NASA concurs with these findings and I have instructed the institutional management and the Space Shuttle Program to implement them as soon as possible. At NASA, safety is the bottom line. This report validates our actions and will guide us as we continue."

The panel's review included 22 recommendations, many of which address a need for NASA to take steps to ensure the availability of a skilled and experienced workforce in sufficient numbers to meet ongoing safety needs. The panel also noted that other activities occurring within the agency have the potential to generate safety problems. It cited specifically: a reduction-in-force during assembly of the International Space Station; and a concern that unrealistic funding levels and imposed schedules could place undue pressure on NASA and contractor management. The panel said that meeting the demands of these externally applied pressures can force decisions which increase risk.

An executive summary is available online at ftp://ftp.hq.nasa.gov/



The STS-81 crew takes a break from the Terminal Countdown Demonstration Test at Kennedy Space Center. The crew is schedule to liftoff from Launch Pad 39B Jan. 12 for the sixth shuttle/Mir docking. The Atlantis crew will pick up Cosmonaut Researcher John Blaha and leave Astronaut Jerry Linenger for a four-month stay on the Russian Mir Space Station. From left are, Commander Mike Baker, Mission Specialists Marsha Ivins, Jerry Linenger, John Grunsfeld and Jeff Wisoff and Pilot Brent Jett.

Managers meet Monday to set STS-80 launch

Following a reduced holiday work schedule, preparations of Atlantis at Launch Pad 39B are now returning to full strength aiming at a launch as early as Jan. 12 for STS-81, the fifth shuttle-Mir docking mission.

Atlantis' payload bay doors were

shut for the final time prior to launch on Thursday, and shuttle managers will meet on Monday for a final flight readiness review, following which an official launch date will be announced. The crew of STS-81—Commander Mike Baker, Pilot Brent Jett, Mission Specialists John Grunsfeld, Marcia

lvins, Jeff Wisoff and Jerry Linenger-would travel to KSC at the end of next week for a Jan. 12 launch. The launch countdown will begin on Jan. 9. The launch window for Atlantis on Jan. 12 begins at 3:27 a.m. CST.

The hatch actuators on Atlantis were removed and internal screws in the mechanisms were checked. replaced, tightened and locked with an adhesive following the hatch actuator failure on Columbia during

STS-80. All of the hatch actuators had been reinstalled and retested aboard Atlantis by Christmas Eve.

Meanwhile, Discovery is being readied for the second flight of 1997, STS-82, to be launched around Feb. 13. STS-82 will be the second Hubble Space Telescope

servicing mission. As work resumes on Discovery this week, upcoming milestones will include moving the spacecraft from the processing hangar to the Vehicle Assembly Bldg. to be mated with the STS-82 solid rockets and fuel tank on Jan. 10. Discovery is scheduled to be moved to Launch Pad

39A on Jan. 17.

ATLANTIS

Elsewhere, Columbia resumes preparations this week for the third flight of 1997, STS-83, targeted for a March 27 launch. STS-83 will carry the Microgravity Science Laboratory-1 aloft for a 16day stay in space. Columbia currently remains in KSC's Bay 1 shuttle processing hangar and stacking operations began just before Christmas on the STS-83 solid rockets in the VAB.

Mir crew celebrates Christmas in space

BLAHA

Blaha took time out during the holidays to send holiday greetings from the Russian Mir Space Station and talk with reporters about plans for the holidays.

"I certainly wish everybody on the planet a very merry Christmas, a happy New Year," Blaha said. "I would like to wish all of you peace and goodwill, to all of the creatures who are living on the planet, as well as tell everybody that our planet is a very special place in the cosmos and in the universe. From space, here on the Mir space sta-

those who have things need to share with those who don't, to make our planet a more special

"I would also like to say, as I give you this Christmas message, that of course the whole purpose of Christmas — and this is Christmas Eve right now on board the Mir space station in orbit

- is to celebrate the birth of Jesus

Cosmonaut Researcher John at Christmas time I would just like approximately 1,996 years ago, so

Before the holidays, Blaha and his crew mates Mir 22 Commander Valery Korzun and Flight Engi-neer Alexander "Sasha" Kaleri talked with reporters about their holiday plans.

"Certainly we have a number of things we will do on Christmas," Blaha said. "I personally have a number of Christmas presents from people on the ground that came up on the Sasha and Valeri and we'll have a special meal that day. There will be a two-way video teleconference with my family on Christmas. Brenda will be there with my son Jim and my daughter-in-law and my grandson, and my daughter Caroline and my son Steven. I think my mother is going to be there as well. So we will have that, and it will be a nice and very exciting Christmas day, I think, for me."

'We're going to have an outstanding menu, a menu that will include both Russian and American products," Korzun said. "We will

Please see BLAHA, Page 4



A rock, a record, a rover and a new rocket were among the top NASA stories for 1996.

In an announcement that caused all humankind to take pause, NASA Administrator Daniel S. Goldin and a team of scientists revealed in August that a meteorite from Mars strongly suggested that primitive life may have existed on that planet more than 3 billion years ago. In a press conference at NASA Headquarters, a research team showed the world pictures of the first organic molecules thought to be of Martian origin; several features characteristic of biological activity, and possible microscopic fossils of primitive, bacteria-like organisms inside the ancient meteorite.

In vowing to pursue the investigation of this historic discovery, Goldin said "The evidence is exciting, even compelling, but not conclusive. It is a discovery that demands further scientific investigation. NASA is ready to assist the process of rigorous scientific investigation and lively scientific debate that will follow this discovery." Goldin invited governments from around the globe to participate in the continuing investigation of the meteorite.

Astronaut Shannon Lucid set a new record for an American living in space and broke the world's record for a woman living in space by spending 181 days aboard the Russian Mir Space Station. Lucid, who conducted microgravity and life sciences experiments aboard the Mir with two Russian cosmonauts, returned to Earth aboard Atlantis

President Clinton presented Lucid with the Congressional Space Medal of Honor in an early December ceremony, citing Lucid "for her contributions to international cooperation in space ... Shannon Lucid is an explorer in the best tradition of those who dare to challenge the unknown."

Lucid's stay on Mir was part of continuing U.S. - Russian space cooperation, which is setting the foundation for the International Space Station.

In a continuing effort to learn more about Mars, the U.S. launched two new spacecraft to the Red Planet in 1996. The Mars Global Surveyor and the Mars Pathfinder missions were both successfully launched from NASA's Kennedy Space Center.

Mars Global Surveyor, due to rendezvous with Mars in September 1997, will spend four months dipping into Mars' atmosphere using a technique called "aerobraking." Starting in 1998, the Surveyor will begin compiling a systematic database as it surveys the Martian landscape and photographs unique features, such as polar caps and Mars' network of sinuous, intertwining river channels.

Mars Pathfinder, set to land on Mars July 4, 1997, is designed to test the feasibility of a new low-cost method of delivering a spacecraft, science payload and free-ranging rover to the surface of the Red Planet. Once deployed, the lander will transmit back to Earth science data collected during descent through Mars' atmosphere. The rover, named Sojourner, will then activate an onboard camera and send back images to Earth, signifying the start of its exploration.

Mars was not the only planet to reveal startling new secrets in 1996. NASA's Galileo spacecraft, in its flyby and probe deploy at Jupiter, revealed many previously unknown facts about our Solar System's largest planet. Galileo's Probe, which was successfully sent into Jupiter's violent atmosphere in December 1995, provided new discoveries for NASA scientists. New information on the extent of water, clouds and the chemical composition of Jupiter's atmosphere was revealed.

As Galileo sped by Jupiter's moons, new details of the satellites began to emerge. On Ganymede, Jupiter's largest moon, scientists were intrigued by three-dimensional pictures of giant, icy fissures and evidence of a magnetic field. Galileo also reported that "warm ice" or even liquid water may have existed, and perhaps still exists, beneath the cracked icy crust of the moon Europa.

Galileo found that the volcanically-active moon to had noticeably changed since it was last observed 17 years ago by the Voyager spacecraft. In November, Galileo flew by Jupiter's moon Callisto, investigating the strange, pockmarked fourth moon, so different from its other active siblings.

Living up to its role as one of the "great observatories," the Hubble Space Telescope

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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.

Loving Feelings Concert: Johnny Rivers 8 p.m. Feb. 8 at the Arena Theater. Tickets

EAA Spring Break Special to Rome: March 8-15, \$1,099 double occupancy. \$200 deposit required. Final payment due Jan. 8.

Space Center Houston: Adult \$8.75; children (4-11) \$6.25, annual membership \$25.95, family membership (up to four) \$59.95.

Movie discounts: General Cinema, \$4.75; AMC Theater, \$4.50; Sony Loew's

Franklin Planner refills: now taking orders for 1997 calendars.

Stamps: Book of 20, \$6.40.

Entertainment '97 books: Cost is \$25.

Gold C Books: Cost is \$10.

"Orbit": The book "Orbit" by Jay Apt, Mike Helfert and Justin Wilkinson is on sale for

Metro tickets: Passes, books and single tickets available.

Gilruth Center News

Sign up policy: All classes and athletic activities are first come, first served. Sign up in person at the Gilruth Center and show a NASA badge or yellow EAA dependent badge. Classes tend to fill up two weeks in advance. Payment must be made in full, in exact change or by check, at the time of registration. No registration will be taken by telephone. For more information, call x30304.

EAA badges: Dependents and spouses may apply for photo identification badges from 7:30 a.m.-9 p.m. Monday-Friday; and 8 a.m.-4 p.m. Saturdays. Cost is \$5. Dependents must be between 16 and 23 years old.

Hatha Yoga: A stress relieving, stretching and breathing exercise routine to unite body, mind and spirit. Classes meet from 5:30-6:30 p.m. Thursdays. Cost is \$35 for eight weeks.

Nutrition intervention program: A six-week program to learn more about the role diet and nutrition plays in health, including lectures, private consultations with a dietitian and blood analysis. Program is open to all employees, contractors and spouses. For more information call Tammie Shaw at x32980.

Defensive driving: One-day course is offered once a month. Pre-registration required.

Stamp club: Meets at 7 p.m. every second and fourth Monday in Rm. 216.

Weight safety: Required courses for employees wishing to use the weight room will be offered from 8-9:30 p.m. Jan. 14 and 28. Pre-registration is required. Cost is \$5

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

Aikido: Martial arts class meets from 5:15-6:15 p.m. Tuesday and Wednesday. Cost is \$35 per month. New classes begin the first of each month.

Aerobics: Classes meet from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is \$32 for

Ballroom dancing: Beginner classes meet from 7-8:15 p.m. Thursdays. Advanced classes and classes for beginner-intermediate and intermediate meet from 8:15-9:30 p.m. Cost is \$60 per couple.

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

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

Dates & Data

Today

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

Monday

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

Tuesday

ABWA meets: The American Business Women's Association, Clear Lake Area Chapter will meet at 5:30 p.m. Jan. 7 at Bay Oaks Country Club. For more information call Kathleen Kaminski at x38706.

ASQC meets: The Bay Area Section of the American Society for Quality Control will meet at 6 p.m. Jan. 7 at Ramada King's Inn, 1301 NASA Road 1. Nancy Forney, senior quality management coordinator for UTMB, will discuss "Quality When Your Life Depends On It." Dinner costs \$9. Reservations are not required. For more information call Ray Swindle at 335-6948.

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

Wednesday

Spaceland Toastmasters meet: The Spaceland Toastmasters will meet at 7 a.m. Jan. 8 at the House of Prayer Lutheran Church. For more information call Jeannette Kirinich at x45752.

Spaceteam Toastmasters meet: The Spaceteam Toastmasters will meet at 11:30 a.m. Jan. 8 at United Space Alliance in the Civic Room at 600 Gemini. For more information call Pat Blackwell at 282-4302 or Ben Black at 282-4166.

Astronomy seminar: The JSC Astronomy Seminar will be held at noon Jan. 8 in Bldg. 31 Rm. 129. An open discussion meeting is planned. For more information call Al Jackson at x35037.

PSI meets: The Clear Lake/NASA Chapter of Professional Secretaries International will meet at 5:30 p.m. Jan. 8 at the Holiday Inn, NASA Road 1. Dinner costs \$12. For details call Elaine Kemp at x30556.

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

Thursday

SSQ meets: The Houston Clear Lake Chapter of the Society for Software Quality will meet at 6 p.m. Jan. 9 at Ramada King's Inn, 1301 NASA Road 1. Jay Crutchfield of Lockheed Martin will discuss "Software Development Using Earned Value." Dinner costs \$10. Reservations are required. For details call Renne Peterson at 335-2034.

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

green beans, buttered squash, pinto beans.

Friday

Astronomers meet: The JSC Astronomical Society will meet at 7:30 p.m. Jan. 10 at the Lunar and Planetary Institute, 3600 Bay Area Blvd. For more information call

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

Spaceteam Toastmasters meet: The Spaceteam Toastmasters will meet at 11:30 a.m. Jan. 15 at United Space Alliance in the Civic Room at 600 Gemini. For more information call Pat Blackwell at 282-4302 or

Astronomy seminar: The JSC Astronomy Seminar will be held at noon Jan. 15 in Bldg. 31 Rm. 129. An open discussion meeting is planned. For more information call Al Jackson at x35037.

fins will meet at 7:30 p.m. Jan. 15 Toole at x33201.

Jan. 16

Directors meet: The Space Family Education board of directors Gretchen Thomas at x37664.

<u>Swap Shop</u>

Sale/Lease: Piper's Meadow, 3-2-2, available 2/1/ 97, \$840/mo plus dep or \$85k. 244-4118 or 282-4914. Rent: Crystal Beach, Galveston Co, beach house, sleeps 10, fully furnished, ocean views, wkly/wknd. 486-1888.

Lease: Middlebrook, 3-2-2, both formals, fans, garage door opener, cood cond, \$875/mo plus dep 281-486-8551.

Sale: Clear Lake Forest 3-2-2, approx 1 acre wooded area, landscaped, new sun room, new roof, remodeled kitchen, \$141.5k. 326-2557.

Lease: CLC 2-1.5-1, trees, jacuzzi, avail 1/1/97. 486-4692.

Sale: Bay Forest, energy eff custom home, 3 BDR den, both formals, wet bar, island kitchen, pool, by owner, \$199,900. 488-3468 Lease: CLC 1 BDR condo, FPL, W/D conn, appl,

ceiling fan, new carpet/paint. Jim Briley, 244-4632 or Rent: Ski condo, Christie Lodge, Avon, CO, wk of 1/6-13/97, \$700 obo. 281-488-0518.

Rent: Sageglen, 4-2-2, 1 story, both formals, den w/ceiling fan, FPL, walk-in-closets, CCISD, no pets, \$850/mo. 282-3229 or 286-4547.

Sale: Shoreacres 4-2-2, 1600 sqft, fixer upper, 15k below market, \$57k, 488-5501. Sale: Large country lot, quiet neighborhood, 0.55

acres, approx 2 mi west of 646-517 intersection off 517, \$12.5k. Randy Crawford, 281-244-1080 or 281-

Rent: South Lake Tahoe cabin, 3-2, sleeps 8, wood le TV, VCR, microwave, modern kitchen. W/D. 244-1065 or 326-2866.

Cars & Trucks

'92 Honda Accord LX, metalic red, gray int, 4dr, ex cond, AM/FM/cass, auto, 111k mi, \$7.8k. 334-2533. '88 Honda Prelude SI, loaded, A/C, pwr sunroof, new tires, timing belt, radiator, cooling fan, \$5.7k obo.

Jody, x37424. 90 Nissan 240SX, htchbk, auto, AM/FM/ cass, loaded, 41k mi, alarm. x48911 or 480-7882.

'93 Jeep Cherokee Sport, 4 dr. 2 WD, loaded, new battery, black/gray, ex cond, 39k mi, \$12,775 obo.

Dan, x34640 or 482-7550. '84 Mazda RX7, 131k mi, clean, new AM/FM/cass, 5 spd, new brakes, \$1.8k. 281-8551.

'86 Chevy Caprice, loaded, ex cond, silver w/blk vinyl top, runs great, \$3.5k, x32889 or 472-8927. '88 Mustang LX htchbk, dr blue, 4 cyl, 5 spd, loaded, ex cond. 120k mi. \$2,495. Bill. x39166 or 481-3545.

'84 Corvette, white w/red int, 84k mi, loaded, leather, new A/C, \$10.9k. Jeff, x41947 or 281-286-6785. '88 Dodge Ram 50 Sport ext cab, rebuilt 2.6L A/C

recent clutch, brakes, 117k mi, \$3,800 obo. x34532 or 480-9364 '93 Ford Ranger, teal, low mi, ex cond, \$7k nego.

280-2661 or 597-0306. '94 Honda Accord LX, ex cond, lo mi, 4 cyl, white ext, tan cloth int, auto 4 dr, loaded, Gus, x33425 or

'93 Ford Ranger XLT, std, A/C, AM/FM/cass, white ext, ex cond, \$5400 loan balance, (409) 925-4244. '81 Mercedes 380SL, convert, 2 tops, baby blue,

100k mi, ex cond, \$12.5k. 281-334-4666 or 344-2205. '84 Nissan Stanza, 5 spd, good cond, maint record, A/C needs work, \$1350. 281-280-0639.

'94 Honda Accord, loaded. David, 484-1779.

'88 Honda Accord LX, 4 dr, 5 spd, A/C, tinted glass, AM/FM/gold color, 119,500 mi, \$3.5k. x30784.

'87 Chevrolet Celebrity 2 dr, maroon, new paint, matching int, A/C, AM/FM/cass, ex cond, 3.5k, 244-

'91 Mercury Sable LS wagon, silver, burgandy cloth, loaded, ex cond, 64k mi, \$7250. 488-4188.

Boats & Planes

V-hull and 50 Hp Mercury O/B, galv trailer, \$1,980. 282-4914 or 244-4118.

'93 Crownline 20, Mercury 305 V8, loaded, low hrs, birnini top, custom cover, Shorelander cust trailer, \$13.9k obo. Don, x38039 or 333-1751.

Mountain bike, 19.5 in Haro Extreme, alum frame, Shumano LX-XT components, Grip Shift SRT 600 shifters, Rock Shox 21R front suspension fork, everything tuned up and in good cond. \$500. 282-9523.

Mountain Bike, 21 speed, red w/black, was \$350 now \$195. 286-8966.

'88/'89 ATK 250 motor-cross dirt bike, ex cond, racing enhancements, \$1.5 obo, 992-1552

Audiovisual & Computers

Technics 35 watt stereo receiver, \$50 obo. Elvin,

Lapis ProColor server, 24x color graphics card for Mac SE/30, \$200: Corduar carrying case for Mac SE/30, \$35; Phone Mate answering machine w/reature phone, 480-3424,

486 DX-II 66 MHz motherboard, 8 MB RAM, VESA local bus, \$80; Promise 5300 EIDE disk controller card, supports 4 IDE devices, \$35, Jeff, x38424 or

Macintosh 15" color monitor, \$300; Stylewriter 2400 color inkjet printer, \$250, never used; Bi-level desk, \$75. x31754 or 486-4273.

Panasonic KX-P1624 24-pin dot matrix printer w/12k internal buffer, prints up to 136 characters per line, up to 16.5 inch wide paper capability, ex cond. \$150 obo. 996-0697. 486-DX50, 8 MB RAM, 270 MB HD, 5.25 and 3.5

FDs, 14" monitor, kybd, mouse, \$50; 486-DX33, 8 MB RAM, 170 MB HD, 5.25 and 3.5 FDs, 14" monitor, kybd, mouse, \$375. Charles, x36422 or 326-5073. Message Pad 130, PC/Mac connectivity, kybd.

Newton Internet Enabler, S/W, was \$900, now \$600 obo, Scott. 998-3398. Borland Turbo C++ 3.0 Visual edition for Windows w/manuals, \$30; MSDOS 6.22 upgrade w/manual, \$20. Linda, x45520 or 996-1073.

Internal 33.6k fax/modem, 480; Internal 14.4k fax/modem, \$30; Visual Basic 1.0, \$20; Photofinish 3.0 CD ROM, \$30. Terry, x36351.

Toshiba laptop 386 w/docking sta, \$450; new DX2-66 and DX4-100, \$695/\$745; new Pentium 100-133-166, \$929/\$979/\$1109; 386, \$250. Don, 33-1751. Nokia LX11 cellular mobile phone, \$50 obo.

332-2229. Infinity SM-150 speakers, 15" bass drivers, 300W RMS, was \$900, now \$350. Randy Crawford, 281-244-1080 or 281-992-7784

Musical Instruments

Classical guitar by Dimentel of Albuquerque, NM, student model, \$400. Steve, x37626.

Upright piano, was \$3k, now \$1k. 479-0276.

Pets & Livestock

Mini-Rex rabbits, \$10 ea. 482-0874. Small grey DSH 3 yr old cat, great personality, spayed, yard/house trained, toys and gear. Edna, x34322 or 281-452-0731.

Black Lab mix, 8 mo old male, great with kids and other dogs, \$60. 489-4549.

Free dog, mix, 8 mo old. Shelley, x37824 or 409-

Cat, 7 yr old long hair calico, \$60. 489-4549. Household

Baby crib, like new, mattress and extras, \$80. 280-2661 or 597-0306. Credenza, \$20; secretary desk, \$40, four toast

toaster, \$5, 332-3168. Washer and dryer, working, \$100 both. 482-0874. Hide-a-bed couch, qn sz, velour, earth-tone print, good cond, \$100. 244-5101 or 281-337-3222.

Matching couch and loveseat w/2 chairs, \$250; one white Lazyboy couch, \$200; refrigerator w/top freezer, \$75: Go-cart, 2 seater, \$125; 1 team autographed

football from '91 N.Y. Giants, \$200. 286-1601. Glass and chrome dining table, rectangle, ex cond, \$99 obo; trampoline, \$10; gas range and oven, \$150.

Antique pine wardrobe, 22"d \times 78"h \times 57"w, double doors, beaded board, knotted pine, \$900, 282-2045. Southwest style overstuffed couch, hugh loveseat and ottoman, Scotchguard heavy cotton, color mostly beige white w/desert sand and turquoise designs, 1.5

yrs old, was \$2,100, now \$800 obo. 280-8369. Imond Kenmore W/D \$275 Kenmore gas dryer, \$115, all ex cond. 332-5345.

Kg sz oak waterbed w/mirrored bookshelf headboard, \$250 obo 281-461-0912 Sleeper sofa and love seat, country blue, good

cond, \$400. Randy, x48271 or 488-1672. Round oak dining room table, 4 dining room chairs, dishwasher. 486-1888. Oak roll top desk, new cond, 4 large drawers plus cubbyholes, \$400 obo. 992-7653.

Kenmore gas dryer, \$100; Litton microwave and stand, \$65; 20" Diamonback bike, \$80; Huffy Montpilier girls IOS, \$50; Tappan gas cooktop, \$30. 244-

On sz waterbed, reduced motion, 6 yrs old, ex cond. oak veneer headboard, oak frame, heater, pads, sheets. \$300 nego. Scott, x36477 or 282-9644.

Dinette table w/4 chairs, smoked glass top, brass legs, like new, \$145. Betty, x37242 or 332-3724. Waterbed, super single, frame, heater, mattress, low motion, padded sidewalls, \$50, 281-482-7156,

Antique oak kitchen table w/ornate pressed back chairs, \$800; pair custom designed hand-carved love seats, down filled cushions, \$800; designer oriental style coffee table, extra thick glass top, \$350; pair antique solid oak end tables, \$150. 488-5564.

Wanted

Want female roommate to share house in Clear Lake, \$275/mo all bills included. Theresa, 244-5089 or 480-6980 Want non-smoking roommate to share large 3

bedroom home in Clear Lake area, \$375/mo w/bills paid. John, x30543 or 286-7384. Want parts for FZR600, building a racebike, Eric.

x32857 or 334-3468. Want housemate, 3-2-2, near Ellington, non-smoker, \$350/mo plus 1/2 util. Bob, x40233 or 481-4134.

Want mature female to share 3-2-2 w/owner. Jan '97, no pets, non-smoker, \$400/mo, plus \$200 deposit. 484-8640.

Want non-smoking female to share new 4-2 home near South Shore Harbour, W/D, cable, all house privilages incl large deck w/grill, no pets or children, \$500/mo all bills paid. 334-0833.

\$300/mo, separate phone, plus \$100 deposit. 488-Want Ruger #1V. Varmint model, will consider trading S&W 44 mag or bolt action 243. Charles, 661-

Want non-smoking roommate to share 4-2-2. CLC.

Want electric guitar w/amp, \$250 max. 482-0874. Want non-smoking male or female roomate, new 2500 sq ft South Shore Harbour house, all privileges,

\$350 plus share util, Brian, 488-4383. Want late edition encyclopedia set. 281-326-2307. Want roomate in Pasadena area, \$350/mo. Tamela,

x36155 or 998-8859, voice or TDD. Want Super 8mm movie projector; 16mm camera and projector; or 35mm movie camera. Michael,

x38169 or 482-8496. Want old Macintosh computers, cheap. David, 244-4203.

Miscellaneous

Antique collectable Jim Beam bottles, \$10 ea. 280-

Stock tank, 9 ft diameter, best offer, 482-0874. Off-road Go-Cart, 5 Hp. \$375; baseball equipment. sm Georgetown starter jacket, \$35; Pro skatepoard. \$20; bike helmet, \$10; pet porter, \$15; offshore life jackets, \$35/pr. x33137 or 334-2533.

Two Presidents First Lady Gold Charter membership, \$400. x35753 or 337-2002.

Exercise bike, electronic display, variable resistance, \$100. Jeff, x38434 or 992-9571. Bumper pool table, \$50; Kirby vacuum cleaner

\$25; large Hotpoint microwave, \$75. Hubert, x39248 White baby weighing scale, \$20; boy's newborn and infant clothes; girl's infant through 3T clothes; baby bath tubes, \$2 ea; Avon bear diaper stacker, \$3.

Shari, 486-6691. Christmas tree stand, plastic, holds tree up to 9 ft. \$10. Warren, x34204.

Exercise equipment, Precor 618e rowing machine, \$50: Nordic Track Achiever ski machine, \$300: Weatherby Mark V 300 magnum rifle, \$700; Leupold rifle scope, 3-9 x 50mm Vari-X II, \$200. David, 281-

Various 5.0 Mustang parts, block, 8.8" rear, nitrous Fric x32857 or 334-3468 Vitamaster ski machine, ex cond, was \$300, now

\$150. 282-2221 or 482-0765. Stairclimber, \$50. Shelley, x37824 or 409-943-Camper top for small pickup, aluminum w/wood

frame, side windows, curtains, and roof vent, \$100. Scott, x38957 Aviation lithographs by William Phillips, highly col-

lectable, no longer available; Colt AR-15 lightweight Sporter, 7.63×39 , scoped, 3-100 rnd mags plus ammo, \$1425; N-guage train layout, \$60. Tim, 283-5704 or 281-859-8773. Presidents and First Lady Gold Charter member-

ship, \$550; ladies' 28" blue fox jacket w/white fox

tuxedo collar/yoke trim, \$350. x39393 or 997-2280.

new Killer Bee 46' driver, \$130. David, x38122 or 338-8783. Car top luggage carrier, like new, \$25; folding

umbrella baby stroller, \$5; baby crib, dark brown, ex cond. \$20. Howard, x37346. Howa rifle, formerly Smith and Wesson 1500, bolt action, .223 cal. new, \$300; Browning .22RF A-bolt,

Golf clubs, 1-SW, peripheral weighted, \$125/set;

new, \$300. x37346. Executive office chair, seat, back and arms covered

with grade A burgundy German leather, swivel tilt w/built-in lumbar support, \$99. 771-0955. Body tech home gym, like new, 4 stations, dual

stack, \$499 obo. 482-9576. Solid wood door, 32", w/sliding window, never hung, \$65; Little Tikes 4 ft play cube w/slide, \$50; self propelled, rearbag lawn mower, \$40. George, x32498

or 332-6978 Jumpking trampoline, 14 ft diam, ex cond, \$175.

Barry, x39042 or 996-8648. Saloman SX31 ladies' ski boot, sz 7, 310, \$50; Salomon SX91 Equipe men's ski boot, sz 10, 340, \$100, ladies' ski pants, sz med, \$20; RCA Pro 8mm camcorder, \$350; bread slicing machine, \$20; Samsonite hard case brief case, charcoal, \$50. 334-1119.

Canon electric typewriter, \$69; home water and air filter, \$29 and \$99. x48769 or 486-7111. Golf Tour Model III 2-PW irons, Tour wrap grip and Harrison graphite shafts, 2 mo old, \$250. x39260 or

Saddle, ex cond, new sheepskin padding and leather straps, also 3 girths, different sizes, \$300; halter and bits. 713-326-5385.

Nordic Trac Pro, 2 yrs old, \$350 ono. x31755 or 554-2619. Matching Whirlpool W/D, ex cond, \$200 obo; 3.5

Hp B&S rear bagger 20" mower, \$100; charcoal/wood burning barbeque grill on wheels, \$20; elec 18" lawn mower, \$50; white miniblinds, 46"×71", \$5. x37371 or Lifestyler 8.0 treadmill, 1.25 Hp dc motor, \$325:

2400 Global Village Macintosh modem, \$20; Kenwood dual cassette deck, ex cond, \$85. Bob, x33149. VHF oscilloscope, \$50; 2 new truck side mirrors. \$20 both. 281-992-6286. Light green couch and love seat, \$350 obo; Ping

look-alike men's golf clubs, \$150; misc golf clubs, \$5-\$25 ea; 3 golf pull carts, \$5 ea; men's 26" 10 spd bike, \$20; ladies' 10 spd, \$20. x34151 or 280-0341. Golf clubs, irons 3 ,5, 7, 9 woods 1, 3, putter, golf bag, head covers, 1-4 and putters, all \$50. Tom,

x48233 or 286-7001. Bodytech home gym, ex cond, 4 stations, dual stack, \$499 obo. 482-9576.

Craftsman 10 in radial arm saw, \$250: 10 in bench top table saw, \$50, 3 wheel band saw, \$50, 15" scorll saw, \$50. Larry, x49103 or 992-1696. Tire for boat trailer, w/rim, unused, \$50: 21" alum-

inum prop for Mercruiser I/O 135Hp engine, \$50. Robert, x37739. Bruce Jenner Power Trainer and 3 training videos.

\$180 or trade. 282-9929. Utility trailer, approx 4'x8', light weight ex cond, \$200; tow bar and mounting bracket, \$100. Grady,

Exerc skier, \$25; microwave cart, \$35; women's dress shoes, 71/2-8 narrow, 7 pr, \$20 ea. 554-5492. Bentwood rocker, \$35; Tandy computer w/monitor,

printer, S/W, \$75; antique school desk, \$55. 291-9225.

Chuck Shaw at x35416.

steamed cauliflower.

Jan. 15

Spaceland Toastmasters meet: The Spaceland Toastmasters will meet at 7 a.m. Jan. 15 at the House of Prayer Lutheran Church. For more information call Jeannette Kirinich at x45752.

Ben Black at 282-4166.

Scuba club meets: The Lunar -

at the Redfish Restaurant under the Kemah/Seabrook bridge, Sea brook side. For details call Fred

will meet at 11:30 a.m. Jan. 16 in Bldg. 45 Rm. 712D. For details call

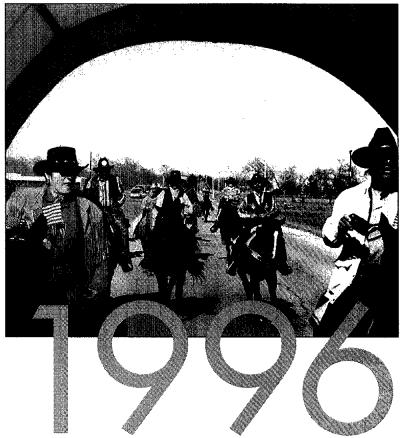


JANUARY 🗗 Its official, NASA Administrator Daniel S. Goldin names George Abbey director of JSC after serving as acting director for several months. Abbey replaced Dr. Carolyn Huntoon after she was named to lead planning for a new sciences institute for biomedical research.



MARCH

STS-76 lifted off March 22 to deliver the second American to the Russian Mir Space Station. Astronaut Shannon Lucid settled into to Mir while Astronauts Linda Godwin and Rich Clifford record the first space walk while docked to the



FEBRUARY

The first JSC trail ride brings out several horseriding employees lead by a traditional

covered wagon. The trail ride was one of many activities around the center during "Go Western" days. Look for expanded rodeo events around the center this year.

THE Year IN Pictures

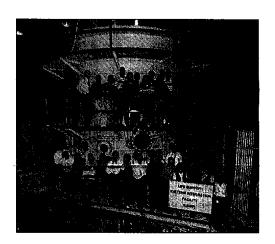


APRIL For the first time in history a Russian extravehicular space suit is lowered into the Weightless Environment Training Facility. The Orlan suit will remain at JSC to train astronauts and cosmonauts for the International Space Station.

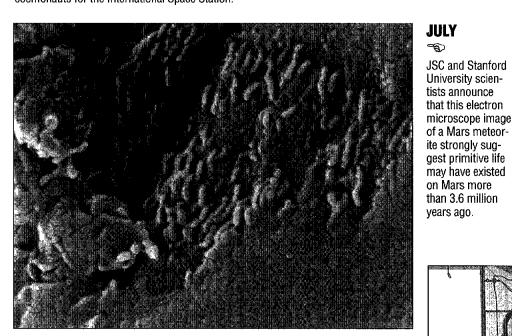


MAY

Bill West of Rockwell International carries the Olympic torch through the streets of Houston. West and Paula Vargas of Taft Broadcasting were selected to carry the torch because of their voluntary contributions to the community.



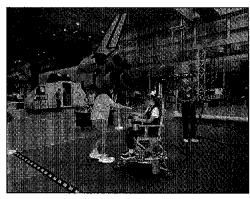
The Advance Life Support team takes a moment outside the regenerable life support test chamber before saying good-bye to co workers Doug Ming, John Lewis, Katy Hurlburt and Pat O'Rear who spent 30 days sealed inside the chamber.



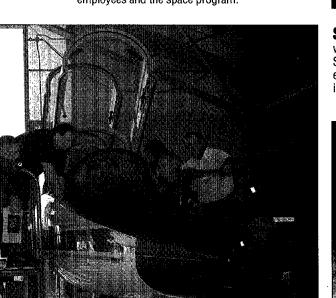
OCTOBER

other members of the Ellington Field Fire Department give live demonstrations on the best techniques for extinguishing fires during Safety and Total Health Day. Under blue skies and pleasant temperatures, JSC employees spent the day

health issues.



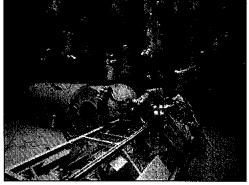
While the weather may have kept large crowds away from JSC's Open House, the visitors who did brave the weather praised JSC employees and the space program.



NOVEMBER 🖑 JSC engineers, scientists and managers showcase their technical advances in Bldg. 9 during the first NASA JSC Inspection. More than 1,200 top executives from companies in 28 states took advantage of the opportunity to learn about JSC's mission, technologies and facilities.



endurance records posting 188 days in orbit including 179 days on the Russian outpost.



DECEMBER Astronauts Jerry Ross and Linda Godwin make the first suited dive in JSC's spacious new Neutral Buoyancy Laboratory in the Sonny Carter Training Facility.



Hubble returns dynamic images of other galaxies, stars during '96

(Continued from Page 1)

showed images of galaxies colliding, the surface of Pluto and the birth of stars during

In April, Hubble sent back dramatic images of gigantic tadpole-shaped objects surrounding a dying star. The "cometary knots" are probably the result of a dying star's final outbursts, seen in the Helix nebula. The Space Telescope continues on track for measuring the expansion of the universe, sending back information that fine-tunes the Hubble Constant. Scientists are using the telescope to try and place the Hubble Constant to within a ten percent accuracy.

Compiling a "cosmic movie" of the Crab Nebula, Hubble found the Nebula even more

dynamic than previously understood. Hubble measured the diameters of a special class of pulsating star called Mira variables, which rhythmically change size. At 11 billion lightyears away, they existed during the epoch when it is commonly believed galaxies started to form. Hubble concluded the gigantic, old stars are not round but rather eggshaped. That discovery may preview the fate of our Sun five billion years from now.

Hubble also surveyed the "homes" of quasars, showing that they live in a remarkable variety of galaxies, many of which are violently colliding. The complicated image Hubble sent back suggests there may be a variety of mechanisms for "turning on" quasars, the universe's most energetic objects.

Hubble introduced us to images of what may be galaxies under construction in the early universe, being made out of a long sought ancient population of "galactic building blocks." Those images show a grouping of 18 gigantic star clusters that appear to be the same distance from Earth, and close enough to each other that they will eventually merge into a few galaxy-sized objects.

In October, Hubble followed the spectacular dance of Jupiter's aurora, allowing astronomers to map Jupiter's immense magnetic field and better understand how it generates such phenomena.

In a quest for a faster, better, cheaper access to space in the 21st Century, Vice President Al Gore and Goldin announced that Lockheed Martin was selected to build the X-33 technology demonstration vehicle, a one-half scale prototype of the Reusable Launch Vehicle which will be used to demonstrate advanced technologies that will dramatically increase reliability and lower the costs of putting payloads into space.

Lockheed Martin will design, build and conduct the first test flight of the X-33 test vehicle by March 1999, and conduct up to fifteen flights by December 1999. NASA has budgeted \$941 million for the project through 1999, with Lockheed Martin contributing over \$200 million. Called "Venture Star," the unpiloted vehicle will launch vertically like a rocket and land horizontally like

Test subjects needed for blood analysis

The Human Test Subject Facility at JSC is currently recruiting volunteers to participate in astronaut and cosmonaut blood-draw training sessions.

This activity, approved by the JSC Medical Sciences' Institutional Board, provides crew members with the opportunity to gain proficiency in venipuncture blood collection techniques. Crew members on future shuttle missions as well as cosmonauts participating in the joint U.S./Russian endeavors will participate in these training sessions if in-flight blood collections are required during their mission

Volunteers must be in good health and pass the required physical exam. Volunteers should be healthy individuals, 21-50 years old, height/weight proportionate that are not taking any medications, and have no major health

Prior to participation, a volunteer will receive a briefing so he/she fully understands what will be happening. An average crew training session takes 15-30 minutes per volunteer, and volunteers may be compensated for their time

To volunteer or for details, contact Linda or Rori at x37284.

Computer fair prices still available

The vendors who recently participated in JSC Exchange's Computer Fair have agreed to extended their offer for special deals on com-

The computer fair was a big hit with all who participated," said organizer Karl Schuler. "Over 85 computers were sold, and the Exchange has received a number of inquires from folks asking if they can purchase a computer after the fair. In response, we're shifting to a "virtual" fair and will keep the Computer Fair's home page running until mid March."

Schuler said that the vendors agreed not to raise prices for the next 90 days. Buyers will need to reference the computer fair when they follow-up with the vendors.

"We're also forming partnerships with other agency Exchanges and will be auctioning two computer systems sometime in January if all goes according to plan," he added.

M and A Technology and Applied Computer Technologies-two of the vendors who have been involved with the center's recent computer block buys—are offering special deals to employees through March. In addition, the JSC Federal Credit Union has special provisions for loans on electronic equipment.

These special prices are open to all NASA civil servants, contractors and retired personnel. For more information, reference the recent computer fair's home page at the following URL: http://hro.jsc.nasa.gov /hro/eaa/The_EAA_Computer_Fair. HTML or call the Exchange or Schuler at x33031.



From left, Neha Mehta, a senior at South Houston High School accepts congratulations from chief judge Mark Morgan after winning the American Free Enterprise

Local students cash in during speech contest

A South Houston senior took home a \$300 savings bond last month and a chance to win another \$10,000 bond.

Neha Mehta took first place with a speech about the American dollar bill in the American Enterprise Speech Contest hosted by the Lockheed-Martin National Management Association last month at the Gilruth Center. Mehta will represent the NMA chapter at the Texas Gulf Coast Council competition in March. Mehta has been to the National's as an ambassador and has experience in speech and math competitions and varsity tennis.

The second place \$200 bond went to Shane Carter and the third place \$100

bond went to Kevin Held, both seniors at Friendswood High School.

The Clear Lake Communicators, Toastmasters International judged the eight entrants. The students were judged on speech development, purpose and value of the speech, delivery and language. The purpose of the contest is to promote a better understanding of the American Enterprise System among high school students. Involving youth in research, writing and delivery of a speech on the economic system can increase awareness in the importance of a free economy and helps develop communication skills that are vital to individuals entering the workforce.

Changes to effect Gilruth, cafeteria

Changes to fee structures and services at the Gilruth Center and JSC cafeterias recommended last year by the JSC Exchange Council are now in effect.

Employees will need badges to use the Gilruth Center weight room, gym, tennis courts, leisure classes or to participate in organized sports. Existing badges will be honored until they expire except for use of the weight room. The annual fee for badges except for the weight room is \$10. Badges may be purchased by NASA/contractor employees; their dependents or spouses; retirees and spouses; and other government employees with NASA issued badges. Outside users also may purchase badges that will allow them to participate in organized sports and leisure classes only at

The annual fee for use of the weight room will be \$90. There will not be an additional \$10 badge charge. The fee for a second, or more, family member will be \$50 each. Badges/membership for use of the weight room are available to NASA employees, retirees and contractors and their spouses and eligible dependents. Weight room badges/memberships may be used for all Gilruth activities.

Fees for league sports will be \$315 for basketball; \$175 for volleyball; \$335 for flag football; \$275 for soccer; \$275 for softball; and \$200 for recreational softball. There will be a single fee structure for all teams and each participant will be required to have purchased a Gilruth Center badge. All badges and membership fees may be purchased at the Gilruth Center office in Bldg. 207. Questions can be directed to the Gilruth Recreation Director, Eddy Rodriguez at x35789, or the EAA Vice President for Athletics, Bob Musgrove at x33057.

In addition the cafeteria will change its hours of operations in the new year. The cafeteria will be open from 7-10 a.m. for breakfast and 11 a.m-1:30 p.m. for lunch. The Gilruth Center will be open 6:30 a.m.-10:00 p.m. Monday - Friday, and 9 a.m.-1 p.m. on Saturday.

Other changes in the near future include:

- Remodeling of the cafeterias to improve lighting, reduce noise and update the serving and seating areas at both cafeterias:
- Reopening the JSC Exchange Store in the Bldg. 3 cafeteria and broadening the inventory of store items;
- · Increasing the choice and availability of event tickets offered through the stores; Opening up food service at the Gilruth Center to
- off-site commercial caterers and restaurants to broaden choices for groups planning events;
- · Increasing the opportunities for organizations to use the Gilruth Center facilities for "pot luck" dinners;
- · Providing contractor involvement and input through representation on the Exchange Council; and
- · Adding new "heart healthy" items on the cafeteria

Blaha vows to help build space station in '97

(Continued from Page 1)

have traditional cakes and other dishes, lamb, pork and a wonderful dessert, as well as Italian food, macaroni and cheese, and other things.

Reporters asked Blaha whether he would make any New Year's resolutions.

"I haven't thought about that, but you ask me the question so I'll do my best to answer." He said. "I think any New Year's resolution I would make is that I hope the space program and this space station and a replacement for it, which we call the International Space Station, we continue to build. It's certainly the right thing to do. Space plays a vital role in our society, so my New Year's resolution would be that I wish we continue pressing forward with this. From a personal note, I've learned a lot up here. Maybe when I return to Earth I'll try to apply some of it to try and be a nicer human being."

Before the holidays the crew spent time performing housekeeping and maintenance chores. Science activities included monitor-

including the visual inspection of the growth of bovine cartilage cells, as well as sampling of the media in the BTS. The crew performed a direct feed of the growth media to the cartilage cells and sampling of the media in the BTS.

The BioTechnology System is a facility that will be used throughout joint U.S. - Russian flights to grow tissues in microgravity. On this mission, bovine, or cow cartilage is being grown. By growing cartilage in microgravity, researchers will obtain a better three-dimensional model which they can compare to cells grown on the Earth, helping to determine how cells grow in different environments. Researchers say this kind of research, not possible because of the gravity on Earth, eventually may lead to development of new drugs or medical procedures.

The crew also monitored a second wheat crop growing in the Mir greenhouse. Air being drawn into the greenhouse returned to normal temperatures, approximately 25 degrees Celsius, and will be monitored daily for fluctuations that

ing of the BioTechnology System, could affect plant growth. The That's one exercise, and it takes sprouts that were planted on Dec. 6, were around 12 centimeters in height, showing somewhat rapid growth rate.

A Mir Structural Dynamics Experiment studying the night to day transition vibrations of Mir was performed. Several more sessions measuring the vibrations of Mir during exercise, and the docking and undocking of space shuttles are

Throughout his four-month stay on Mir, Blaha exercises daily and explained his regime to reporters.

'I do an exercise regime here daily that the Russians have been doing on this space station for now 11 years," Blaha said. "That is, we have a treadmill here [in the base blockl and a treadmill in the Kristall module. You set a particular load on there and run for a certain period at different paces, you walk, you run.... In between you use expanders for different muscle groups in your legs, neck, arms, shoulders, and waist. It's a program they have developed over the years. It's a very good program.

about an hour to accomplish.

"Another thing we do on the same day, about six hours later we ride on the bicycle. We do that for our cardiovascular systems. We ride a different schedule of times and loads and we do that for a period of about 45 minutes and that also is very good. So one of the exercises is for muscles and the other is for cardiovascular health.

'I might say, I think it's an excellent program and I highly recommend that we start with that program on the [International] Space Station. As to how I think I will feel when I return to Earth, I don't know. That's a very individual thing and different people have different reactions to returning to Earth. That's why we continue to do [cardiovascular] experiments, to try to understand why there are differences in different people when the come back to Earth. In the past on shuttle flights I haven't had a problem, but I may have a vestibular problem when I return this time. I don't know; we'll have to wait and find out."