NASA
National Aeronautics and Space Administration
Lyndon B. Johnson Space Center
Houston, Texas

Triple threat

The Mission Operations Directorate is planning a three-pronged reorganization to deal with the 1990s. Story on Page 3.

Ghostly gang

The folks in printing distribution had a ghoulishly good day celebrating All Hallows Eve in Bldg. 227. Photos on Page 4.

Space News Roundup

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Ceremony to officially open 9B

By Pam Alloway

Next Wednesday's grand opening of the Space Station Mockup and Trainer Facility will announce the space station's move from drawing boards and design pads onto the display floor in the newly completed Bldg. 9B.

An opening ceremony scheduled to commemorate the event promises to be a celebration complete with a ribbon cutting, officials' speeches and tours giving JSC and contractor employees, and guests a first-class introduction to the full-scale mockup of the modules and nodes that will comprise Space Station *Freedom*.

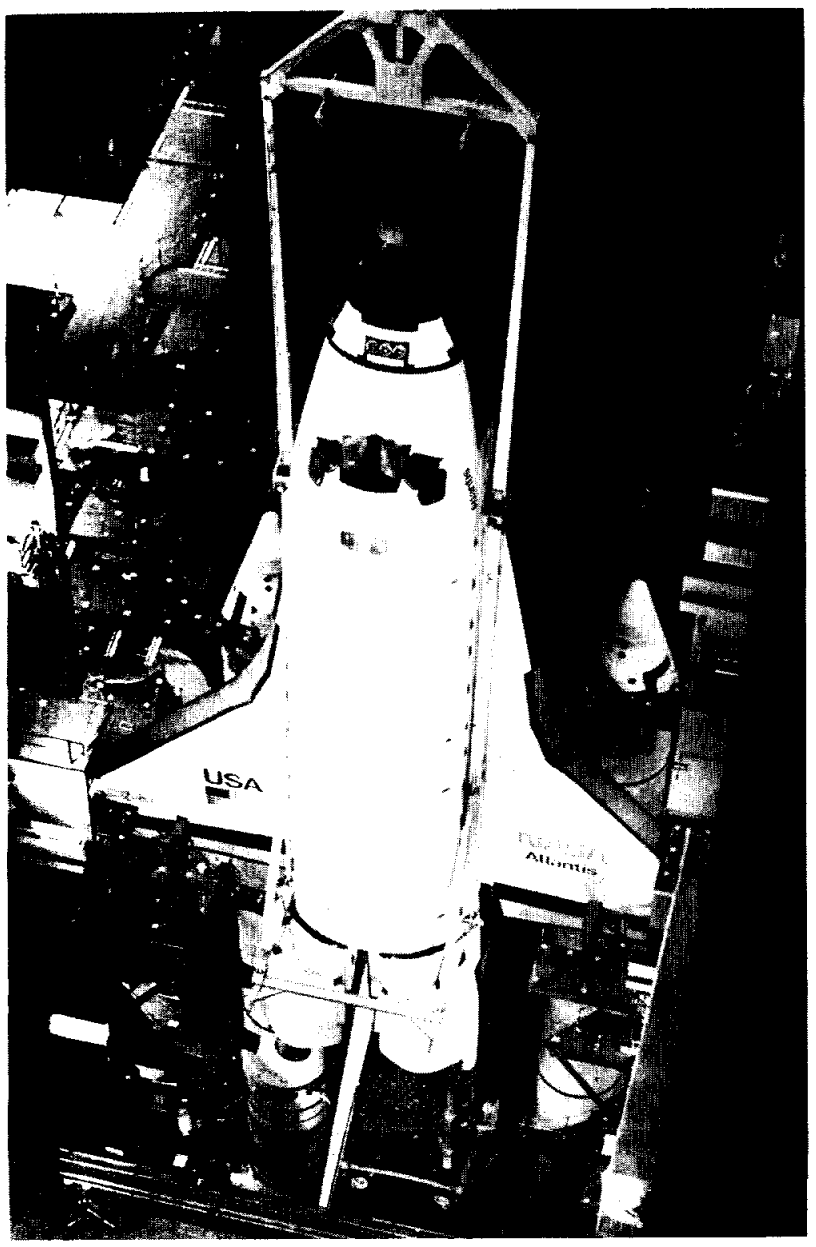
Buildings 9A and 9B will open for general tours and a scheduled program at 2:30 p.m. Wednesday. JSC Director Aaron Cohen, Clarke Covington, manager of the Space Station Projects Office, and Dr. Carolyn Huntoon, director of Space and Life Sciences, are among the NASA officials scheduled to speak. Buildings 9A and 9B will remain open for tours until 5 p.m., said Frances Walls Tewhill of Johnson Engineering Corp. Johnson Engineering is among the five contractors that have supported the space station mockup and will have exhibits at the grand opening. Other contractors that have provided support services to the new mockup and training section are: Lockheed (LESC), McDonnell Douglas, Rockwell International, and Bendix Field Engineering.

Workers have set up four of the five modules that eventually will comprise the mockup and which will accommodate the crew habitation quarters, the laboratory, the Japanese and the European Space Agency modules. Workers later will set up a resupply or logistics module that will house surplus food and equipment, and a Crew Escape and Return Vehicle (CERV) mockup, said Vernon Hammersley Jr., chief of the Man-Systems Division's Facilities Operations Branch.

The mockup also includes four connecting resource nodes that will provide extra storage space and serve as airlocks between docking vessels and the modules in addition to housing command and control equipment.

Employees who are unable to attend the grand opening in 9A and 9B can

Please see **CEREMONY,** Page 4



NASA Photo

HANG TIME— *Atlantis* is hoisted high above the ground by a 250-ton crane in the Vehicle Assembly Building and carried toward her solid rocket boosters and external tank. The Space Shuttle was rolled out to Launch Pad 39B late Tuesday after mating on Oct. 23.

Atlantis moves to launch pad; 'dry count' set

Atlantis is now on Launch Pad 39B awaiting her third trip into space, scheduled to lift off no earlier than Nov. 28.

The Shuttle was rolled out of Kennedy Space Center's Vehicle Assembly Building (VAB) late Tuesday night and was in place at 39B by 7 a.m. CST Wednesday. Roll out of *Atlantis* had been delayed two days due to a three-inch piece of wire lodged between a washer and the Orbiter under a bolt that is one of *Atlantis'* three main connections to the external tank (ET).

STS-27

The sling that hoists *Atlantis* to a vertical position inside the VAB was reattached to the Orbiter to take weight off of the connection, the bolt was loosened and the wire removed. By Monday afternoon, technicians had reconnected the Orbiter and ET at the left aft attach point, where the wire problem was located, and again removed the sling.

Early Tuesday, workers finished closeouts of the Orbiter's aft compartment and made minor repairs to the ET's thermal protection system. About 11 p.m. Tuesday, *Atlantis* began its six-hour, 4.2-mile trip to the pad.

The Rotating Service Structure was moved into place around the Shuttle late Wednesday morning.

Atlantis is to be launched on the 27th Shuttle mission, a mission dedicated to the Department of Defense, between 5:32 a.m. and 8:32 a.m. CST. Although launch currently is planned for no earlier than Nov. 28, an official target launch date will be determined at a flight readiness review scheduled for Nov. 15 and 16.

At the pad this week, workers have checked the auxiliary power units of the Orbiter and solid rocket boosters (SRBs). A check also is being conducted to verify the connections between Pad 39B and the Shuttle.

A major activity planned at the launch pad in the middle of this month will be the terminal countdown demonstration test (TCDT), or dry count, a dress rehearsal of launch day for the flight crew and launch team. STS-27 will be commanded by Hoot Gibson, piloted by Guy Gardner and include mission specialists Mike Mullane, Jerry Ross and Bill Shepherd.

Atlantis has received the same return-to-flight modifications, begun in March 1987, as *Discovery. Atlantis* was transferred from the Orbiter Processing Facility to the VAB on Oct. 22.

Stacking of the SRBs for STS-27 took a little less than three months, beginning on July 30 and finishing on Sept. 20. The ET was mated to the SRBs on Sept. 20.

Working group devising centerwide orientation

By James Hartsfield

A working group of representatives from each area of JSC has been formed to devise a centerwide orientation and training program for new employees.

The new orientation program may be along the lines of the Mission Operations Directorate's (MOD's) Phase 1 training program for new hires, said Bobbie Swan, leader of the group. Swan, who normally works in MOD crew training, has been assigned to head the effort to create a centerwide program.

Swan has been studying orientation programs at other NASA centers and at various directorates within JSC. Of the JSC directorates that have training programs, MOD's is by far the most extensive, she said. MOD's program includes half-day orientation sessions three days each week for eight weeks. A host of senior employees brief the new workers and quizzes are given each week. While going through the training, the new hires are expected to keep up with their normal duties. MOD's program is somewhat of a model, but the centerwide program may not be as extensive, Swan said.

Among the ideas she has studied from other centers is an orientation panel with all heads of directorates plus the center director featured in an open forum for new hires. "This is going to be a neat project," she said. "I'm really enthusiastic about it. We hope to orient new employees to JSC in a way that they're aware of what the center has to offer, where they are in their organization and where they fit in at JSC."

The benefits of a solid orientation and training program are evident in the successful results of MOD's program. "That program has led to increased performance and employee involvement," she said.

For a centerwide program, the working group will have to determine if all new personnel should go through it or just some, how much time the program will entail and whether or not it should include both on-site contractors and civil servants or only civil servants, she added.

"We want to make the employees feel like a citizen of their organization quicker, instead of feeling like a new employee," Swan said. "We also have to find a way to orient new employees in a way satisfactory to all divisions

Please see **GROUP,** Page 4

Student's crystals grow differently

Astronaut's quick reaction documents experiment results

By Pam Alloway

STS-26 mission specialist Pinky Nelson's close observation of an onboard student experiment may have helped enable the young designer of the experiment to prove his point.

In the experiment, designed by 24-year-old medical student Richard Cavoli, lead crystals grew differently in microgravity than on Earth. The object of the experiment was to produce purer and larger lead crystals that may help improve X-ray film resolution.

Cavoli's experiment, one of two student experiments on board STS-26, consisted of a plexiglas tube divided into four sections. After reaching orbit, Nelson opened two valves on each end of the tube allowing lead acetate and potassium iodide to enter the inner chambers that also housed a semi-permeable membrane. When the crystals began growing, they formed a thin layer over the entire membrane, an unexpected result that Nelson noticed and captured on film.

"There is a clear difference between what he (Cavoli) got on Earth and what he got in microgravity," said Neil Christie, an integration engineer for Johnson Engineering Corp. Christie, a NASA contract employee, and John Jackson, NASA's student experiments manager, supervise and coordinate the student experiments destined for outer space flight.

"In the shuttle the crystals formed completely over the membrane and on Earth they form only over the lower half of the membrane," Christie said.

Nelson's observation of the unexpected crystal growth and subsequent photographs provided valuable documentation of the newly discovered phenomenon, Christie said.

Although Cavoli and his adviser, Charles Scaife, a Union College chemistry professor, continue to study the results of the experiment and further test the crystal growth, they are pleased with the unexpected development, Christie said.

Such a result appears to support Cavoli's hypothesis that lead crystals grown in a weightless environment would be purer and larger, Christie said.

Improved crystals could be used to improve X-ray imaging and lessen the doses of potentially harmful

Please see **CRYSTALS,** Page 4

NASA Photo

Lead crystals trapped in an STS-26 student experiment test chamber unexpectedly cover both halves of a semi-permeable membrane. On Earth, the crystals form only on the lower half of the membrane.

JSC

Dates & Data

Today

Combined Federal Campaign—JSC Combined Federal Campaign will run through Nov. 10. This year's goal is $265,000. Campaign representatives will be calling on JSC employees during the campaign. Anyone who does not know who their representative is may call Teresa Sullivan, JSC campaign coordinator, at x38970. Retirees may call Sullivan at 483-8970.

Call for papers—The American Society of Quality Control (ASQC) is seeking innovative papers written on subjects such as applications in quality and productivity or the use of data systems for improving quality, productivity and competitiveness. The papers will be presented at the second annual South Texas Quality, Productivity and Data Systems Conference, Feb. 23-24 at the University of Houston's Hilton Conference Center. For consideration, send a brief abstract and biographical sketch, both less than 300 words each, a one page outline brief and a black and white photograph. Materials must be received by Dec. 15. For more information, call Eugene Berger, 333-0967.

Giants of astronomy—The Houston Museum of Natural Science's fall planetarium program will feature "A Journey to the Center of the Universe" through Nov. 20. The program begins with the studies of the universe by the ancient Greeks and continues down a trail blazed by Copernicus, Tycho Brahe, Kepler, Galileo and Newton. For more information, call 639-4607.

EAA badges—Dependents and spouses may apply for a photo identification badge from 6:30-10 p.m., Monday through Friday at the Rec Center.

Aerobics and exercise—Both classes are ongoing, and employees may sign up for them at the Rec Center. For more information, call x30303.

Cafeteria menu—Entrees: seafood gumbo, fried shrimp, deviled crabs, ham steak, salisbury steak (special). Vegetables: buttered carrots, green beans, June peas.

Monday

Cafeteria menu—Entrees: cream of chicken soup; beef burgundy over noodles, fried chicken, barbecue link, hamburger steak (special). Vegetables: buttered corn, carrots, green beans.

Tuesday

BAPCO meets—The next meeting for the Bay Area PC Organization (BAPCO) is set for 7:30 p.m. at the League City Bank and Trust. For more information, call Earl Rubenstein, x34807, or Ron Waldbilig, 337-5074.

Cafeteria menu—Entrees: beef and barley soup; beef stew, shrimp creole, fried chicken (special), sweet and sour pork chop w/fried rice. Vegetables: stewed tomatoes, mixed vegetables, broccoli.

Wednesday

Bldg. 9B grand opening—All JSC employees and contractors are invited to the grand opening of the Space Station Mockup and Trainer Facility, Bldg. 9B, at 2:30 p.m. Wednesday. Guests will be able to view Space Station *Freedom* mockups, refreshments will be served and a band is scheduled to be present.

Secretaries to meet—The Clear Lake-NASA Area Chapter of Professional Secretaries International (PSI) will have its next meeting at 5:30 p.m. Nov. 9 at the Holiday Inn on NASA Road 1. Astronaut Story Musgrave will give a slide presentation on the "Human Experience in Space." Dinner begins at 5:30 p.m., followed by the program and business meeting at 7 p.m. Cost of dinner is $9. To make rservations, call Mary Todd, 282-3942. For more information, call Lillian Hudson, x31032, or Rose Wilson, x30312.

Introduction to bridge—A basic introduction to bridge for those who have never played is given from 5:15-7 p.m. every Wednesday at the Rec Center. Cost is $10. For more information, call x30303.

Cafeteria menu—Entrees: seafood gumbo, fried perch, New England dinner, swiss steak (special). Vegetables: Italian green beans, cabbage, carrots.

Thursday

AIAA lunch and learn—The AIAA Houston Section Space Systems Technical Committee will host a lunch and learn session at the Bldg. 3 cafeteria from 11:30 a.m.-12:30 p.m. The speaker will be Andre Sylvester of NASA, and the topic will be "Orbital Maneuvering Vehicle Simulation in the Systems Engineering Simulator." Bring a lunch and enjoy the talk. For more information, call Michael Laible, 282-4573.

Weight safety—The next weight safety course required for employees wishing to use the Rec Center weight room will be from 8-9:30 p.m. Cost is $4.

Artificial Intelligence Satellite Symposium—The IEEE will host a fourth annual symposium on "Artificial Intelligence and the Knowledge Worker Productivity Challenge: The Payoff and the Potential." The conference will be from 7:30 a.m.-noon. For registration information, call Dr. Zafar Taqvi, 333-6544, or Eddie Robinson, 333-7029.

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

Nov.11

Cafeteria menu— Entrees: seafood gumbo; baked scrod, broiled chicken with peach half, salisbury steak (special). Vegetables: cauliflower au gratin, mixed vegetables, buttered cabbage, whipped potatoes.

Nov. 16

Open season—The Office of Personnel Management (OPM) will hold open season for the Federal Employees Health Benefits Program Nov. 14-Dec. 9. Also, the Human Resources Office will sponsor a one-day Health Fair from 9 a.m.-2 p.m. Nov. 16 in the ballroom of the Rec Center. For more information, call x32681.

Nov. 19

Defensive driving—Defensive driving class will be taught from 8 a.m.-5 p.m. Nov. 19 at the Rec Center. Cost is $20.

Dec. 1

Stress and Aging Parents seminar—The Employee Assistance Program will present a seminar on "Stress and Aging Parents" from 11:30 a.m.-12:30 p.m. in the Bldg. 30 auditorium. Dr. Howard Eisner, a gerontologist from the University of Houston-Clear Lake, will discuss intergenerational relationships, things to expect from aging parents and options for providing care for parents.

Dec. 7

Supercomputers conference—The IEEE will hold a video conference on "Supercomputers" from 10:30 a.m.-2 p.m. Dec. 7 in the Rec Center. For registration costs and other details, call Nancy Marshall, x30174, or Eddie Robinson, 333-7029.

JSC

Swap Shop

Swap Shop ads are accepted from current and retired NASA civil service employees and on-site contractor employees. Each ad must be submitted on a separate full-sized, revised JSC Form 1452. Deadline is 5 p.m. every Friday, two weeks before the desired date of publication. Send ads to Roundup Swap Shop, Code AP3, or deliver them to the deposit box outside Rm. 147 in Bldg. 2.

Property

Sale: Pasadena/Deer Park, 1980 14' x 60' Redman mobile home, 2-2.5, covered patio deck, shed, skirting, $14,000 principle or VA. Jim, 280-2226 or Faye, 998-0719.

Sale/Lease: Baywind I condo, 2-1.5-2, W/D, suitable for 2 to share, newly painted, $350/mo. plus elec. and dep., sell for appraised value. 333-3992.

Lease: Forest Bend, 4-2-2, FPL, fenced, quiet street, ex. cond., $550. x33369.

Sale/Rent: Piper's Meadow, 3-2-2, formal dn., fence, gas appl., corner lot, near pool, $550/mo. 280-9822.

Sale: Galveston beach house in Pirate's beach, all appl., fully furnished, $129,000. 488-0667.

Rent: Galveston beach house in Pirate's beach, all appl., TV, W/D, FPL, $600/wk., $100/day. 488-0667.

Sale or Lease/Purchase: Kirkwood South, large custom 2-story, 4-2.5-2, formals, family room, FPL, study, intercom, cul-de-sac lot, near Dobie H.S.,, $74,900 or $650/mo. 488-5210.

Rent: League City, Glen Cove, 4-2-2A tri-level, family room/FPL, fans, Jen Aire, fenced, sec. lights, CA/H, park & boat ramp, $650/mo., $600 dep., no pets. 337-4051.

Lease: Baywind II, 3-2.3, 2 story, W/D conn., FPL, stove, D/W, refrig., near pool, children OK, prefer no pets, $500/mo. plus dep. Ariel Thomann, x34111 or 331-2203.

Sale: Madisonville, TX., 18.763 unimproved acres, timber, mostly hardwoods, good road, elect., telephone, water avail., ex. squirrel and deer hunting, $950/acre. Roland, 480-3377 or 538-1697.

Lease: Galveston beachfront home, 3-1.5, 2 decks, spectacular view, quiet pedestrian beach, fully furnished, no smokers, no pets, dep., $300/3 day weekend, $500/wk., $1,500/mo. 436-1070.

Sale/Lease: League City, Newport, 4-2-2, approx. 1,900 sq. ft., large trees and large fenced back yard, $65,000 or $550/mo., both nego. Karl, x31236 or 554-6180.

Rent: Large 2 BD upstairs apartment, W/D, $365/mo. Eric, x38420 or Herb, 481-1253.

Sale: Heritage Park, 3-2-2 custom home, tile entry, walls of windows in living & dining rooms, beautiful custom kitchen, new deck & fence, both baths redone, vanities custom, new paint inside and out, wallpaper, miniblinds throughout, $58,500. Tony or Lorii, 482-5139.

Sale: Friendswood/Wedgewood area, custom built home, 3-2-2, assume at 9 1/2%, no qualifying, $69,500. 996-8240.

Lease: Pebblebrook condo, El Lago, 1-1, mirrored walls, mini blinds, W/D, new carpet, upstairs unit, 650 sq. ft., $300/mo. Lindemann, 488-3300 or 532-2218.

Sale: Friendswood/Sun Meadow Estates, wooded lot in estab. neighborhood, cul-de-sac, bordered by stream & gold course on 2 sides, approx. 245' deep & up to 86' wide, approx. 1/3 acre, util. on site, $31,500. Doug, x32860 or 486-7412.

Sale: Omega Bay Bayou Vista bulkhead lot, water on both sides, 60' x 90'. Tom, 690-1477.

Sale: Colorado Co., scenic property, deer, secluded, oak trees, easy owner financing. 479-7162.

Lease: Sagemont, 4-2-2, has 2 extra car ports, pool, FPL, BBQ grill, fenced yard, garage door opener, near elem. school, $650/mo. plus dep. David, 282-4519.

Sale: Lot, Pearland, Dixie Hollow subdivision, all util., concrete street. x39530 or 482-5003..

Lease: CLC, Oakbrook, 3-2-2, fenced, $500/mo., avail. 11-15-88. 326-6782.

Rent/Lease: Waterfront, 2-1 condo, exercise room, on lake, $499/mo., $49/mo. util., option buy. Ed, 326-2221.

Lease: Nassau Bay, 4 BD home on quiet street, approx. 2,200 sq. ft., FPL, 2-car garage, gas range, ceiling fans, no pets, $800/mo. Jay, x32771 or 326-2316.

Rent: Mobile home lot, $85/mo., $50 dep. Oklahoma and Kinne, Bacliff. 488-1758.

Vacation Rental: Lake Livingston waterfront, 3-2, fully furnished, coverted decks, pier, ex. fishing, swimming, skiing, new cond. 482-1582.

Sale/Trade: Norman, Oklahoma, 4-2.5-2, 2,800 sq. ft., low equity, immaculate, will trade for house at Clear Lake City. 482-6609.

Sale: League City, 3-2-2, cul-de-sac, landscaped, low equity, FHA 10% fixed assum. David, x35464.

Sale: Crocket/Golden Acres, lake lot on Houston county lake, wooded, elec. and water, 100 ft. water front by 200 ft. deep, $19,950, OBO. Ed, x33824 or 333-3279.

Cars & Trucks

'59 Mercedes Benz 220S, $3,000. David, x35464.

'79 Oldsmobile Cutlass, AM/FM cass., low mi., new tires, good cond., $2,000, OBO. 280-9822.

'85 Ford Exp 2 dr. hatchback, auto., A/C, 59K mi., 4 cyl., 30 mpg, AM/FM cass. stereo, $3,200, OBO. Steve, x34176 or 486-8424.

'76 Chev S/W, ran good til battery died, rust, need brakes, poor tires, BO. 333-3992.

'85 Mallard, 35 foot motor home, loaded, low mi., $36,000. 337-4051.

'86 Toyota pickup w/camper, 4 spd., A/C, F/M stereo, 36K mi., $4,200. Wayne, x34266.

'80 Mustang, 2 dr., 5 spd., new tires, clean, $1,995; '81 Pontiac Phoenix, 2 dr., auto., $1,950, OBO. 474-3401.

'84 Mercury Cougar, white w/wire wheels, tinted windows, 65K mi., AM/FM, all elec., good cond., tilt cruise, $5,400. 943-9880.

'85 Ford, 2 dr. Exp H/B, 5 spd., no air/ AM/FM stereo cass., 55k mi., $3,000. Larry, 282-3161 or 996-1013.

'81 Datsun 280Z, A/C, 5 spd. trans., AM/FM digital stereo, ex. cond., $3,800. 538-1711.

'84 Ford F150 XLT King Cab, 8' bed, mat, camper, rear slide window, $6,950; '85 Nissan 300 ZX T/top, metallic brown, 37K mi., ex. cond., $9,800. 480-9810.

'84 Pontiac 6000 LE, 2 dr., sun roof, all elec., stereo, $4,000. 326-2251.

'72 Datsun 510 station wagon, good cond., good work car, runs well, great paint job, $700. x30274.

'85 Plymouth Duster Turismo, 5 spd., 60k mi., gold w/gold int., $2,700. 480-9481 or 554-5011.

'81 Toyota Corolla SR-5, liftback, A/C, P/S, P/B, blue, AM/FM stereo cass., w/eq, new int., 100K mi., ex. cond., $1,995. Ben, 280-7336 or 482-8998.

'83 Lincoln Continental, silver and black, 84K mi., ex. cond., leather int., digital dash, computer, priced below loan value. 484-4198.

'67 Mustang, 289 V-8, 3 spd., new paint, AM/FM stereo, A/C, lots of new parts, runs & looks great, $2,995, OBO. x38169 or 482-8496.

Cycles

'80 Honda 750, low mi., mag wheels, kept in garage always, $1,150. x30092 or 481-3637.

'79 XT500 Yamaha Enduro, good cond., new battery, brakes, bearings, $675. Wayne, 488-9005, x272.

'80 Honda CB 750 F, black, good Dunlops, S.S. super trapp, K&N air filter, ultra reliable, $1,000. Bruce, x34925 or 923-4571.

Boats & Planes

Mirage ultralight, 3x control, double surface wings, 35hp fan cooled Kawaski, 1000 fpm climb, ASI-EGT-CHT, $3,000, OBO. Kowis, x37850 or 477-6178.

Audiovisual & Computers

New, unopened Wordstar Professional 4.0, $100. 485-4995.

Atari 5200, w/Pac-man, Centipede, football, and 10 more games, $100. Tony, x35966.

TI 59 program calculator, elec. engineering, math statistics and leisure modules, manuals, security lock/printer, $100. Alan, x38313.

Household

Beige sofa/love seat, 8 pillows, $250; fruitwood bedroom suite, dresser/mirror, chest, night table, double bed, mattress/box spring, $250. Bruce, 280-7536 or 488-6724.

Wood desk, $50; 2 blue fabric living room chairs, $40; large cherry coffee table, $15; 2 maple end tables, $30; large rocking horse, $10. Bruce, 280-7536 or 488-6724.

Antiques for sale; drop leaf table, $225; Army foot locker w/brass corners, $85; brand new Westclair lamp, hand painted w/beige colors, $90. Kimberly, x30274.

Pair heavily carved Spanish chairs, new upholstery, $500 both; antique school desk, very old, ex. cond., $65; French bench, antique, $200; antique blue venetian glass chandelier, $150. 488-5564.

Mirrors, gold-veined, 45" x 91 1/2", two each, like new, $200 for two or $125 each, OBO. Doug, x32860 or 486-7412.

Rattan couch, good cond., $125. 480-8938 or 333-5821.

Early American lampstand, $25; cushioned chair, $65; round 42" diameter, gold-leaf table, $60; terrarium, $10. 534-3885.

Ward's chest freezer, ex. cond., $100; Zenith console TV, $50. 486-8459.

Two LR chairs, $45 ea.; two end tables, $25 ea.; matching Bassett dresser, $60 and nite stand, $30; 90" sofa, $70, all ex. cond. Ben, 482-8998.

Contemporary sofa, ex. cond., neutral tan/brown pattern, $100, OBO. 486-5401.

Hot Point elec. dryer; breakfast table w/4 chairs; iron bed frame; coffee table. 488-6332.

Dinette set w/6 chairs and round table, $120; matching buffet, $45; 2 corner end tables, sq., $15, round, $15; AM/FM radio/turn table console, $45. 488-1326.

New, must sell, sleeper sofa and loveseat, cream background w/pale blue and dusty rose intermittent stripes, scotchguarded, $600. 334-1392.

Cosco high chair, $15; crib-size bedding, includes mattress pads, fitted sheets, blankets, quilts, $15. Carla, x30181.

Like new, traditional style rocker, honey beige velvet, never used, $60, OBO. 482-3519.

Ward's continuous cleaner elec. ignition stove, 1 yr. old, used 6 mos., cream color, very clean. Becky, x36530 or Cindy, 944-4882.

9-piece dining room set, country, light oak; oval table, 6 chairs, BO. 474-2292 or 282-2223.

Like new freezer, $200, OBO; table & chairs, like new, $200, OBO; if you buy both, we'll throw in a blue love seat. Sue, 480-5027.

GE refrig., auto. defrost, 18 cu. ft., ex. cond., $150. Laura, x36665 or 333-9733.

Wanted

Want mouse and associated circuit card for an Apple IIe microcomputer, reasonable. Frank, x30882.

Want computer desk, good cond. Laura, x36665 or 333-9733.

Photographic

B&J solar 4x5 enlarger, $100; Magnalux 35mm enlarger, $20; Gra-Lab 300 darkroom timer, $20. Terry White, 332-5177.

Color darkroom, complete, includes Bessler 23 CIIXL enlarger, dual Dichro colorless, stabilized power supply, extras too numerous to list, $750, BO. x36349.

Mamiya RB67, Pro-5, 6x7 format, W.L. Finder, 120 back, lens, ex. cond., was, $1,400, now, $750. Paul, 554-2035.

Pets & Livestock

Free kittens, 2 mos. old, have shots & wormed. 482-7642.

Free gray male kitten and adult, white female cat, declawed, very gentle. Gloria, 480-8357 or 486-0454.

Finches, Fire Finches, Cordon Bleus, Peter's Twinspots, domestic, closed banded, wholesale. Paul, 554-2035.

Three free kittens looking for a home, shots and access. included. x39176 or 480-5816.

Musical Instruments

For sale or trade, professional Cerwin Vega BG250 bass guitar amp, 250 watt head w/1 large speaker cabinet, one 18" speaker and one 12" speaker in a folded horn enclosure, sell for $450 or trade for 4-track, etc. Mike, 559-2450.

Player piano, $1,300; piano, $300; Kimball organ, two keyboards, $600. 485-4995.

Alvaraz classical guitar, ex. cond., $100, OBO. 280-1652 or 480-2893.

Lost & Found

Bicycle missing from Mission Control Center. J. Axford, x37671.

Personal

Juggling classes, bring your balls, Thursdays at Gilruth Center by the covered picnic area, 5 p.m. or call Scott x32498.

Miscellaneous

File cabinet, 2 drawer legal; file cabinet, 4 drawer roll out. Mike, 488-3102.

Craftsman radial arm saw, $80; DP 300 rowing machine, $40; large wooden rabbit hutch, $35. 282-2802 or 332-0365.

African violet stands, 6' x 4 1/2' x 18" built to meet A.V. growing specs, hand built rough cedar, 3 shelves including light fixtures w/grolux plus full spectrum bulbs, each shelf fits 4 plant trays (incl.) for nursery growing or fits 4-5 large adult plants or combination of both, $100 ea., 2 stands avail. Kathy, x36807 or 944-0802.

'79-'81 honda new A/C car compressor, $200, OBO. Vincent, x30874 or 333-1316.

Jensen AM/FM/cass. car stereo, $25. Vincent, x30874 or 333-1316.

'85 Cadillac Fleetwood, front wheel drive, still under warranty, like new; antique mahogany wardrobe w/mirrored door and storage drawer, $300; antique mahogany mantle overlay w/decorative mirrors and shelves, $300. Tom or Shirley, 690-1477.

A/C compressor and condenser (outside unit), 4-ton, good cond., Gaffers & Sattler brand, $100. H. Stewart, x34557 or 485-1541.

IBM elec. typewriter, key type, $85; microwave stand, $10; TV stand on rollers, $12.50; director's chair, fold up, $10; 2 small blackboards, $12.50 both; heavy duty 1500 watt two position elec. heater, $17.50. 488-5564.

Doors, carpet, misc. hardware, insulation, king size headboard, new or good cond. John, x38178 or 482-5837.

Spa, 310 gal. 5 seats w/recliner, 1.5hp pump, air compressor, gas pool heater, 250 BTU, $1,600. x36607 or 481-2854.

Marlin model 1894 .44 magnum lever action rifle, ex. cond., $195. 474-7433.

Nordic Track cross-country ski exerciser, like new, $375. Gloria, x39691 or 998-9168.

Lauan adjustable shelf, 6' long sprocket rails, 4 shelves, 10" x 48" veneer, varnished, $10. Bauch, 333-3382.

10 gal. aquarium set up, rocks, plants, pump, heater, hood & light, $60. 488-3644.

Nagel's patrick, commemorative prints, #7, #11, #12, #13, #14, #15, $150 to $500. Mike, x32439 or 326-3947.

Ruger Blackhawk 357 mag., stainless steel, 6" barrel, holster included, $190. x30021 or 479-7947.

Centrifugal pump, 1.5hp, teel, 2" inlet, higher press. range, water/mud/etc., $125. 280-8796.

Trolling motor, Shakespear, 3 spd., $59. 280-8796.

AM/FM car radio w/2 speakers, $30. Tony, x35966.

Deer rifle, Remington Model 81 autoloader, .300 Savage, Lyman Alaskan scope, re-blued and refin. stock, ex. cond., $225. Bob, x37300 or 482-7529.

Wheelchair w/footrests, $75; like new walker, $50. 534-3885.

Weider weight bench w/leg lift, incl. weights and bar, ex. cond., $70. 996-8541.

4 BBS alloy rims, 4 bolt w/4.25 inch bolt circle, 2-6x13 w/20x6.0 Goodyear Racing Eagle tires and 2-9x13 w/21.5x8.5 tires. Merrill, x34925.

Ford Aerospace (Space Shuttle team) jackets, maroon, black and navy; eel skin purse, shoes, briefcase and access. 480-1746.

Panasonic KXE 700M electronic typewriter, display, memory, pinwheel letter quality, low usage, $300. Mike, 488-3102.

Extra heavy duty trailer ball platform for 2" x 2" hitch receptical, includes 2" and 2 5/8" 10,000 lb. balls, $40. x33369.

Utility trailers, 5' x 8', $450 and 4' x 6 1/2', $400, alum. wheels, one yr. old, will consider trade for 16' trailer. Wayne, 488-9005, x272.

Mini-14 rifle w/extras, $300; 3/4 Stratavarius copy violin, $300; 2 suits, $80; 4 '76 Capri/Mustang mags, $80; Spectra Physics Class III He Ne Laser, $100. Jim, 280-2226 or 487-4552.

Chevy sm. block heads, unleaded fuel, $50; Pontiac T 400 trans., $50; Saginaw 4 spd. trans., $75; '69 Camaro rear bumper, $20. Craig, 644-0315.

'The stuff of dreams'

Kranz: The next decade will contain MOD's most challenging years ever

The members of the Mission Operations Directorate (MOD) at JSC heard a plan outlined Friday that will reorganize them into three distinct areas to meet the flight operations demands of the 1990s in the Shuttle program, the space station program and other initiatives.

MOD workers were congratulated on the Space Shuttle's return to flight and told they will face more simultaneous challenges, and more opportunities, during the next 10 years than ever in their history. During the coming years, MOD's organization will change to, essentially, a three-pronged directorate: a mission-specific STS operations area, a mission-specific space station operations area and a multi-program operations area that will serve some coordinating functions for both of the others and include all crew training.

A 10-year plan to posture MOD for the challenges ahead is already in hand and was developed more than a year ago, Mission Operations Director Eugene Kranz told his charges at a special, "all-hands" briefing. "Without your diligence, your talents, your pursuit of a dream, there could be no United States manned space program," Kranz said. "The STS (Space Transportation System) is and always will be our number one priority. The STS is the key to our future; without it, no other manned program could exist."

Kranz said program operations during the past year have mushroomed, with the Shuttle returning to flight, continuing support of payloads, funding of the Orbital Maneuvering Vehicle (OMV) project and the start of work on space station mission operations. "All of these are very near-term, now jobs," he said.

The Shuttle and Space Station *Freedom* are national commitments, he added, and Space Station *Freedom* will be a milestone signifying the United States' first permanent manned presence in space.

"This capability (a permanently manned station) is the stuff of dreams," Kranz told a capacity crowd in Teague Auditorium. "It rivals the colonization of America, and historically it will be remembered as the beginning of our voyage to the stars. You people are the ones that will make it all possible."

Soon, Kranz said, it appears that NASA may establish a new initiative, possibly a lunar base. And to support all of these various programs and developing initiatives, MOD must evolve, he explained.

MOD Deputy Director John O'Neill, instrumental in developing the 10-year plan, presented the goals and objectives and the progress already made toward meeting them. The plan includes five major goals, the first of which is to set a course for planning, training and flight control of the coming programs, O'Neill said.

Objectives under that goal are to return the Shuttle to flight and establish its performance, an objective already well on its way to being fully accomplished; to lay a foundation for space station mission operations, a task under way with the recent creation of MOD's Space Station Mission Operations Office; to provide support to new initiatives by providing mission operations concepts and other data, a job that has resulted in the naming of Bill Eggleston as assistant to the director for advanced projects in MOD; and to promote good working relationships with the Department of Defense (DOD), an objective that has been exemplified by MOD's extensive training and preparedness for STS-27.

A second major goal under for the next 10 years is for the MOD to focus on people, "our primary asset," O'Neill said. That goal's achievement will be seen by maintaining the current strong core of skills already in MOD and by ensuring that MOD personnel are offered the challenges of being on "the cutting edge of technology" in the new programs, he added.

New training concepts, such as an enhanced training guide already in the works, also must be developed.

The third goal entails developing a management system and organizational structure that will function well for a multi-program MOD. Maintaining unity within a directorate that will be focused on so many different areas will be a prime concern, O'Neill explained.

The fourth goal is to refurbish, develop and eventually build new facilities that will be needed to accomodate MOD in the future. "We must come up with concepts and facilities that make the best possible use of common assets," he said.

The final major goal for the MOD is to develop the contract management needed for the various programs. "We simply want to continue to build the team relationship," O'Neill explained.

MOD's three-area reorganization plan could adapt or be changed as it is implemented in the future if it appeared necessary, O'Neill said. "But for the present time, this is our approach, and we need an organization conept that can be our baseline against which to measure intermediate organization steps as we transition to a multi-program structure in the future."

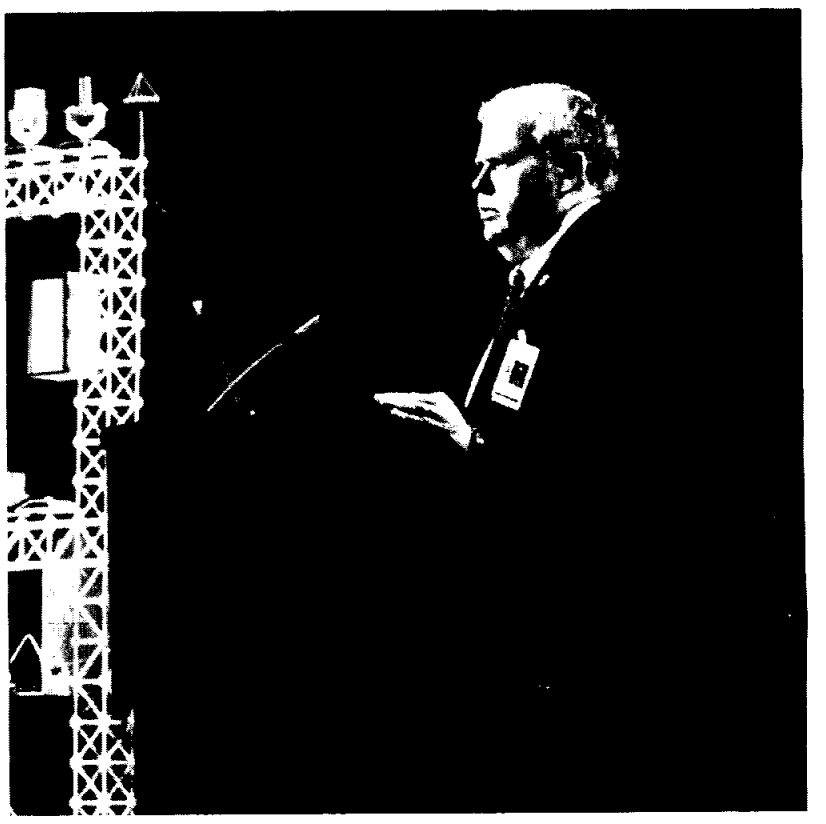
A main feature of the reorganization will be the creation of three new assistant director positions within MOD, one each for STS operations, space station operations and multi-program operations. Flight directors will be under STS operations while mission directors will be under space station operations, he said. Also, two new divisions are to be added, a systems division and an operations division in both space station and STS.

"They will be working in very, very different environments: STS with 14 flights a year progressing through as we do now and space station with seven days a week, 24 hours a day operations," O'Neill said.

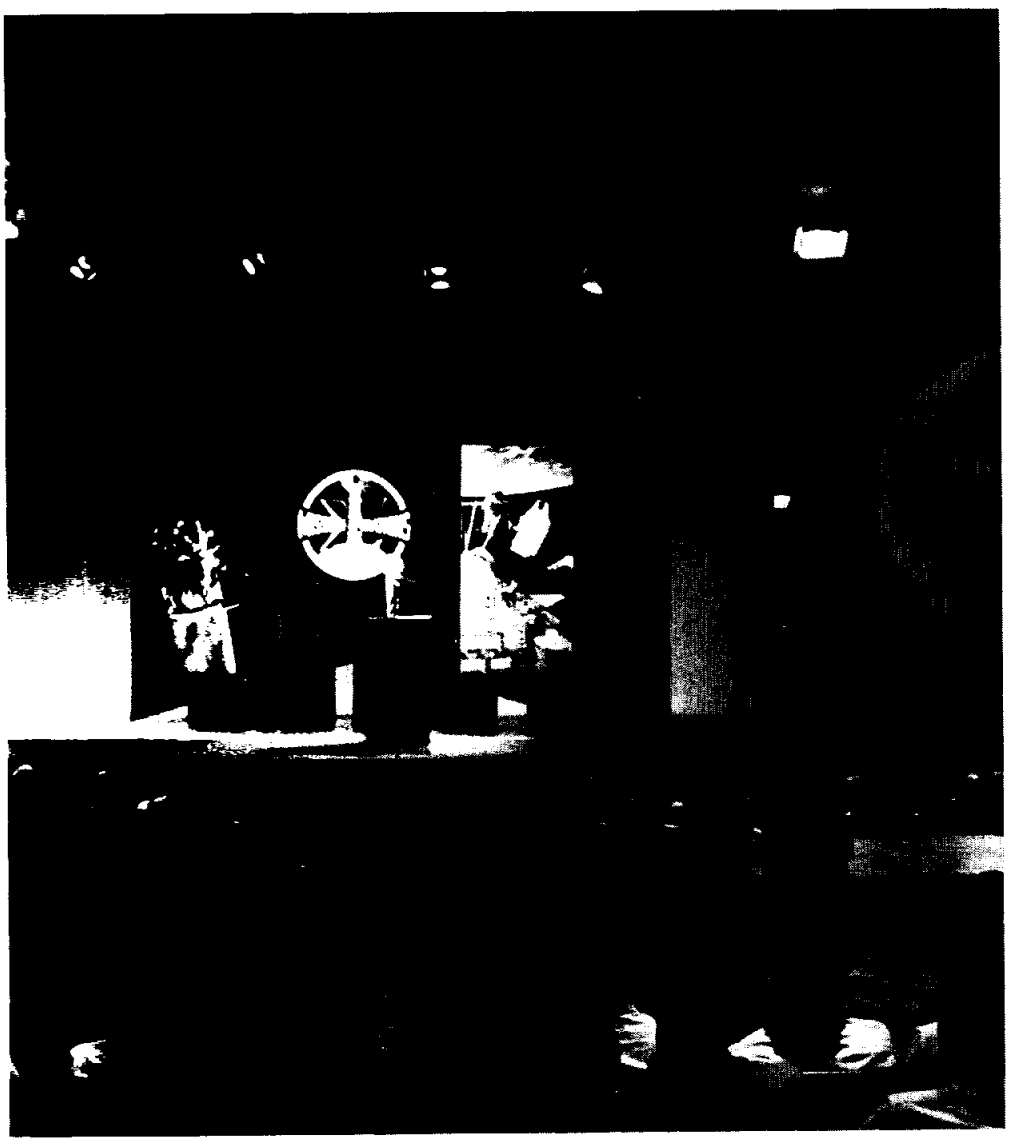
Multi-program operations will encompass scheduling of production flows from both the space station and STS areas. The office also will handle facilities and production activities, such as flight operations documentation. Crew training also will be under the multi-program organization.

JSC Photos by Benny Benavides

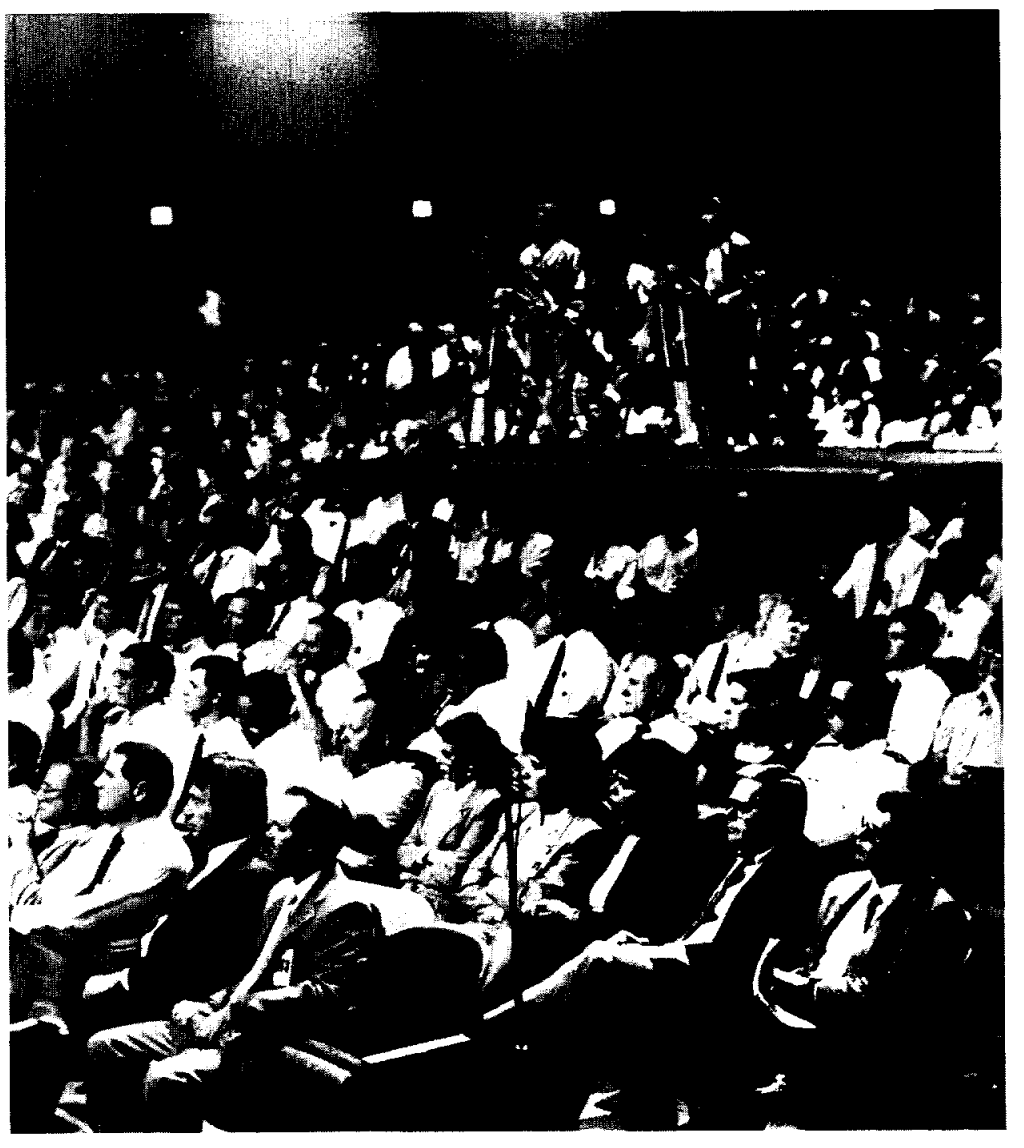
Mission Operations Director Eugene Kranz gave all members of his directorate a special preview of the future at a Friday gathering.



John O'Neill, deputy director of mission operations, outlined a 10-year plan for the future, a period that will see more programs in action than ever before.



Flanked by a model of Space Station *Freedom,* officials from mission operations explain a three-tiered approach to the future of the MOD: Shuttle operations, space station operations and a multi-program office that coordinates some functions of both.



Mission operations personnel packed Teague Auditorium to be congratulated for their work on the Shuttle's return to flight and hear an outline of the many challenges facing them in the various programs of the coming decade.

New team analyzes control, structures tradeoffs

A team of experts from government, industry and academia has been assembled to tackle a dilemma that traditionally has plagued the engineering disciplines of controls and structures—finding the proper tradeoff between a spacecraft's control requirements and its weight, size and structural flexibility.

NASA believes the answer can be found in controls-structures interaction (CSI) technology, which offers potential for greatly improved spacecraft designs of the future.

The CSI program will be directed from NASA Headquarters, and combines the talents and resources of Langley Research Center, Marshall Space Flight Center and the Jet Propulsion Laboratory. Specialists in structures and controls will work side by side to advance an interdisciplinary technology for spacecraft of the year 2000 and beyond.

In conjunction with the establishment of the CSI initiative, NASA has selected eight companies and universities for negotiations leading to award of contracts and/or grants for the first phase of the CSI guest investigator program. This phase one program is a 2-year effort at a total funding level of $2 million.

The companies and principal investigators selected from a field of 62 submittals were:

- Boeing Aerospace Co., Seattle, Dr. J. Michael Chapman;
- DEI-Tech, Inc., Newport News, Va., Wilmer H. Reed III;
- Harris Aerospace Systems Division, Melbourne, Fla., Dr. David C. Hyland;
- California Institute of Technology, Pasadena, Calif., Dr. John C. Doyle;
- Massachusetts Institute of Technology, Cambridge, Mass., Dr. Wallace E. Vander Velda;
- Purdue University, W. Lafayette, Ind., Dr. Robert E. Skelton;
- University of Cincinnati, Ohio, Dr. Randall Allemang; and
- University of Texas, Austin, Dr. Bong Wie.

Guest investigator programs provide a mechanism for strong interaction of ideas and techniques between university, industry and government researchers, often resulting in significant technology advances. The immediate focus for the CSI guest investigator program is on ground-based testbed activities with future in-space flight experiment opportunities to be defined in subsequent phases. The next announcement of opportunity for the CSI guest investigator program is planned for Spring 1989.

The CSI initiative is an outgrowth of the control of flexible structures element of NASA's Civil Space Technology Initiative program. The prime objective of the CSI program is to develop and validate the technology needed to design, verify and operate spacecraft in which the structure and the control system complement each other to meet the requirements of 21st century space missions. Emphasis is on increased analysis and ground testing, with a conservative flight experiment schedule to verify the anaylsis and ground test data. CSI-focused mission categories include large optical systems, large space

DRESSED UP DELIVERY—The printing distribution folks in Bldg. 227 got their work done in spooky style Monday and celebrated Halloween with a costumed luncheon. Above: Both NASA and Omniplan employees joined the fun, including Branch Chief Harry Porter, in the caveman suit. Best costume winners were Rebecca Sutton as the California raisin, Marie Pierce as the dark monk, and Sylvia Michael as Mary of little lamb fame. Right: Gregory Castro, a platemaker, wore one of the more diabolical costumes.

JSC Photos by Sheri Dunnette

Armendariz named top businesswoman

Lupita Armendariz, manager of JSC's Hispanic Employment Program, has been named one of this year's top 10 businesswomen by the American Business Women's Association (ABWA).

Armendariz

Earlier this year, Armendariz was selected from more than 100,000 ABWA members nationwide as one of 2,000 ABWA Women of the Yaar for 1988 from local chapters. From that group of 2,000, she was selected by a three-judge panel as one of the top 10 businesswomen.

She received the honor before 4,000 of her peers at the ABWA national convention in October. Armendariz was selected for her outstanding professional achievements and civic contributions.

As Hispanic program manager, Armendariz is responsible for implementing equal opportunity policies and procedures, and assists in the execution, support and promotion of equal opportunity within JSC and with outside groups and agencies.

She has been a member the Clear Lake Area Chapter of the ABWA since 1979 and has held a variety of offices, including president. She also is active in the Mexican American Engineering Society, the JSC National Management Association, the League of United Latin American Citizens and the Federal Executive Board.

Armendariz received an associate degree from San Jacinto College in 1983, a bachelor's degree in public management from the University of Houston at Clear Lake this year and is now working toward completion of a master's degree in 1990.

Spacesuit contract awarded

NASA recently awarded a contract to the Hamilton Standard Division of United Technologies Inc. for hardware and program and design support of the Extravehicular Mobility Unit (EMU) spacesuit.

The contract, valued at $84,698,800, is a cost-plus-award-fee agreement.

The contract provides for the production of hardware to replace one EMU; for program management and support; and for the design, development and implementation of operational utilization enhancements to improve ground-turnaround operations and on-orbit maintainability.

Work associated with the agreement will be performed at the contractor's facility in Windsor Locks, Conn., at JSC and at various subcontractor facilities. The contract was negotiated non-competitively with Hamilton Standard, the prime contractor for the EMU.

Ceremony recognizes years of work

(Continued from Page 1)

tune in to NASA Select Television and watch the ceremony on monitors throughout JSC.

NASA officials began planning for the housing of a space station mockup and trainer facility in 1984 and construction of 9B began in the spring of 1986. Workers began moving the modules and nodes into the expanded building in late September, said John Trebes, manager of building's mockups. Crews will begin training in the mockups two years before NASA launches the first flight carrying space station materials, said Trebes. Training in the modules could begin in 1993 according to current projections.

Crystals from student experiment still being evaluated

(Continued from Page 1)

radiation. In astronomy, improved X-ray film also could provide finer resolution that would allow astronomers to refine their measurements of a planetary body's position and motion through electromagnetic radiation emissions.

Discovery carried three working sets of equipment for Cavoli's experiment while a fourth set of cylinders was used as a control test on Earth.

Cavoli is a 1987 biology graduate of Union College in Schenectady, N.Y. and currently is a student at the State University of New York's Buffalo Medical School.

Cavoli first proposed the experiment as a high school student in Marlboro, N.Y. when he entered a NASA-sponsored competition. Officials chose 20 experiments out of 2,800 entries. Experiments designed by Cavoli and fellow student experimenter Lloyd Bruce of St. Louis, Mo. were among those few that officials selected.

Bruce, a senior at the University of Missouri-Columbia, and his corporate sponsor, McDonnell Douglas, are analyzing his experiment, which investigated the formation of titanium grain in a weightless environment. Bruce is working toward a general studies degree in computer science, mathematics and classical studies.

The object of Bruce's experiment was to subject a titanium alloy filament to recrystallization temperatures in an attempt to determine whether such a technique would increase grain size, thus resulting in a stronger alloy. STS-26 mission specialist Mike Lounge activated Bruce's experiment during the third day in flight.

"The experiment operated well in orbit," Jackson said. "They are very pleased with preliminary results and now are involved in an analysis of the actual experiment."

If successful, Bruce's experiment could result in a stonger, lighter metal that could be used to construct more fuel efficient airplanes.

The next student experiments scheduled for in-flight testing will investigate the effects of weightlessness on chicken embryo development and bone healing in rats during STS-29. Launch of STS-29 is tentatively scheduled for mid-February

Group using employee input

(Continued from Page 1)

without bogging them down."

Swan said she looks forward to input from center employees, and she's already talked with many workers to find out their individual experiences as they were brought on board at JSC. The ideas and experiences of workers could be very helpful, she said, and any employee who has such information is welcome to call her at x32528.

The JSC Orientation Program Working Group consists of 16 representatives. They include: Joe Atkinson, Equal Opportunities Program Office; Hank Flagg, Legal Office; Norma Kersman, Public Affairs Office; John Thiel and Grace Martinez, Administration Directorate; Rhea Seddon, Flight Crew Operations Directorate; Cindy Draughon, Engineering Directorate; Donn Sickorez, Mission Support Directorate; Jay Honeycutt, NSTS Program Office; Lyn Gordon-Winkler, New Initiatives Office; Bill Larsen, Center Operations Directorate; Beth Beck, Space Station Projects Office; Bobby Martin, Safety, Reliability and Quality Assurance Directorate; Rob Tillet, White Sands Test Facility; Don Robbins, Space and Life Sciences Directorate; and Phil Deans, Orbiter and GFE Projects Office.

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For five-year term

NASA negotiates with Pioneer for support services contract

NASA will open negotiations with Pioneer Contract Services Inc. of Houston for a five-year, cost-plus-fixed-fee contract for logistics support services at JSC.

The five-year contract includes a one-year basic performance period, beginning on or about Dec. 1, and four one-year options. The proposed cost for the five-year program is approximately $60.3 million.

Contracted services include identification, cataloging, receipt and inspection of property; acquisition and inventory management; warehouse operations for stores stock, bondroom operation of program stock and operation of a temporary storage program; logistics plans and analysis; packing shipping and transportation of support services; and redistribution and utilization, supply documentation processing and NASA Equipment Management System documentation processing.

Also submitting a proposal was Staffall Inc. of Houston.