

Vol. 30

# **Spaceweek events celebrate education**

Spaceweek '91 events will include a space festival, a model rocket launch, a banquet, tours and several other affiliated activities to commemorate the annual celebration.

This year's extravaganza will focus on the theme "Look to the Heavens and Learn" and activities are scheduled throughout the week of July 16-24. Similar celebrations of space are held simultaneously each year in more than 150 U.S. cities and nine countries.

"The Houston area has hosted the Spaceweek National Banquet since 1986," said Dennis Stone, volunteer president of Spaceweek National Headquarters which is based in Houston. "We expect hundreds of enthusiastic space supporters to attend as we salute our nation's space leaders.

The Spaceweek National Banquet will be held at 6:30 p.m. July 22 at South Shore Harbor Resort and Conference Center. Featured speakers will include Rep. Jack Brooks (D-Houston), NASA Deputy Administrator J.R. Thompson, and JSC Director Aaron Cohen. The event is black-tie and tickets are \$55. For reservations call 333-3627. Spaceweek National Headquarters is sponsoring this event.

The "At the Threshold" public policy forum is scheduled for 11:30 a.m. Thursday at the Gilruth Center. Speakers will include JSC Director Aaron Cohen; former astronaut



Joseph Allen, the president of Space Industries International and a member of the Advisory Committee on the Future of the U.S. Space Program; David Black, director of the Lunar and Planetary Institute and a senior member of the Synthesis Group; and Glynn Lunney, vice president and general manager of Rockwell's Houston Operations. The American Institute of Aeronautics and Astronautics is sponsoring this event. The charge for the forum is \$8 which includes lunch. Reservations can be made by calling 283-5794

Tours of the Boeing Flight Equipment Processing Facility in Clear Lake will be available July 15-19. Interested space enthusiasts can see actual space suits, food and other items astronauts use in space. The tours are free of charge but reservations are required. For more information or to make tour reservations call 280-2000.

Space Fest 1991 will be held from 10 a.m. to 5 p.m. July 20 at Rice University. It will feature space displays, films, videos, space art, model building contests and special guests. The work of artists dealing with space themes will be judged in a contest for Space Fest 1991. Houston area artist Pat Rawlings, along with Frank Lurz of Mill Valley, Calif., and Kim Poor of Tucson, Ariz., will judge the works. Entries for the art contest are due today. Model builders can enter their miniature spacecraft into a contest and the entries also are due today. Please see SPACEWEEK, Page 4

# Atlantis readies for July launch

Preparations to launch Atlantis perhaps as early as July 23 on STS-43, a flight to deploy a fourth Tracking and Data Relay Satellite, continued to go well Thursday as shuttle managers traveled to the Kennedy Space Center for a final review.

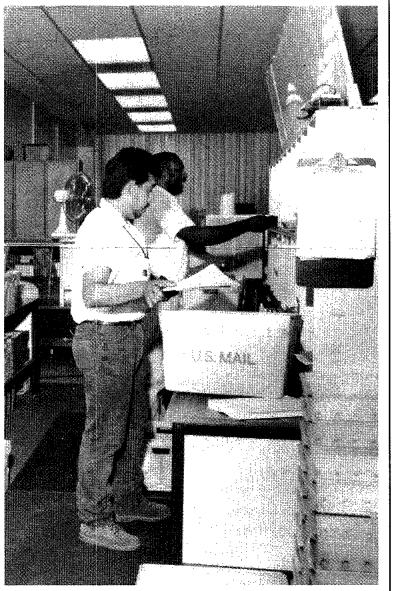
Managers were scheduled to meet Thursday and today for the STS-43 Flight Readiness Review, a thorough study of all aspects of the mission after which a firm launch date is set.

A July 23 launch would be set for 9:54 a.m. CDT with a nominal landing at either 7:11 a.m. CDT July 31 at KSC or 8:39 a.m. CDT at Edwards Air Force Base, Calif.

A Launch Readiness Review, a check of all launch systems needed for the flight, was completed at KSC Monday with no problems identified.

Kennedy Space Center is proceeding toward the safe and successful launch and landing of Atlantis the end of this month,' KSC Launch Director Bob Sieck said following the meeting.

Early this week, Launch Pad 39-A was closed to all non-essential personnel as workers loaded Atlantis' orbital propulsion systems with fuel. On July 3, the STS-43 crew - Commander John Blaha, Pilot Mike Baker and mission specialists Shannon Lucid, G. David Low and Jim Adamson - complet-Terminal Countdown Demonstration Test, a countdown dress rehearsal, aboard the spacecraft.



## JSC Photo by Benny Benavides

Jose Montemayor and Jeff Meachem, Hernandez Engineering Inc. employees and JSC mail couriers, sort JSC's mail in Bldg. 227. Because of a change in the mail service that will limit deliv-

# JSC gives equal opportunity trophy money to education

# By Kelly Humphries

Johnson Space Center will give \$10,000 worth of videodisc equipment and calculators, purchased with NASA Equal Opportunity Trophy winnings, to area elementary schools.

JSC's Deputy Director of Equal Opportunity Programs Freda Marks said the money will be used to support President Bush and NASA's educational initiative by helping generate elementary school minority students' interest and enthusiasm in science and math.

Half of the money will be used to purchase videodisc players in support of the "Windows on Science" program and place them in 25 target elementary schools in need of the equipment. The curriculum program, approved by the Texas State Board of Education, provides coverage in English and Spanish of state-mandated content for elementary science education in grades one through six. Although the software can be provided by school districts with state funds, the hardware must be purchased with local funds.

JSC has identified 25 schools with

# primarily minority enrollment in the Pasadena, Texas City, Dickinson and LaMarque school districts that are without the necessary equipment.

The rest of the money will be used to purchase "Math Explorer" calculators for fourth and fifth grade classes in schools within the Houston Independent School District. The calculators support a Math Technology Program that has been approved by the National Council of Teachers of Mathematics. Research on calculator use indicates that its use promotes achievement, improves problem solving skills and increases understanding of mathematical concepts. JSC is working directly with HISD to identify appropriate schools.

JSC won the NASA Equal Opportunity Trophy in January for its leadership in the balanced placement of women, minorities and the disabled. The committee that recommended the plan to return the money to the community was comprised of Marks, Gregory Hayes, Deputy Human Resources Director; and Dr. Robert Fitzmaurice, Center Education Programs Officer

# Swap Shop Rule Change

Beginning with this week's issue, the Space News Roundup will accept only one Swap Shop ad for the same item.

Ads for the same item will not be repeatedly published in the Roundup because the number of Swap Shop submissions exceeds the available space in the paper.

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. The deadline is 5 p.m. every Friday, two weeks before the desired date of publication. Due to the recent backlog of Swap Shop ads, there may be some delay in the publication of submitted ads. Ads completed on the appropriate form can be mailed to Roundup Swap Shop, Mail Code AP3, or delivered to the wall-mounted deposit box outside Rm. 147 in Bldg. 2.

eries to once-a-day, more couriers will be available at one time to process mail. The center's central mail office processes an average of 40,000 pieces of mail a day. Story on Page 4.



# Bryan D. O'Connor

# O'Connor, Coats leave astronaut corps

Astronaut Bryan D. O'Connor will leave NASA July 29 to become commander of the Naval Air Test Center's Marine Air Detachment in Patuxent River, Md., effective August 2. O'Connor is a colonel in the U.S. Marine Corps.

Astronaut Michael L. Coats also announced he will retire from the Navy and leave NASA Aug. 1 to become the director of advanced programs and technical planning at Loral in Houston. Coats is a captain in the Navy.

O'Connor has flown on two Space Shuttle missions. He was commander on the STS-40 June 5-14, a life sciences research mission, and pilot on STS-61B launched Nov. 26, 1985, in which three communications satellites were deployed and two spacewalks were conducted.

O'Connor also served in several key positions during his 11-year tenure at Johnson Space Center. He was assistant to the shuttle program manager March 1986 -February 1988, chairman of NASA's Space Flight Safety Panel from September 1986 to February 1989, and has been the deputy director of Flight Crew Operations since August 1989.

"My career at NASA has been extremely rewarding," O'Connor said. "I return to the Marine Corps enriched by the experiences and friendships I've gained over these 11 years.'

Coats was the pilot on STS-41D launched Aug. 30, 1984, in which three satellites were deployed and commander of STS-29, a Tracking and Data Relay Satellite deployment mission, launched March 13, 1989. He also commanded the STS-39 crew, the first unclassified Department of Defense flight which was launched on April 28, in which crew members deployed, operated and retrieved the SPAS-II spacecraft to gain research information on shuttle enaine firinas.

Coats also served as the acting chief of the Astronaut Office from May 1989 to March 1990.

"My years at NASA have convinced me that the finest folks in the world are attracted to the space program," Coats said. "I am extremely pleased to be able to change career directions and still be involved with this wonderful group of people."

Donald Puddy, director of Flight Crew Operations, said O'Connor and Coats would be missed.



Michael L. Coats

JSC

# JSC **Ticket Window**

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

General Cinema (valid for one year): \$4.

AMC Theater (valid until May 1992): \$3.75.

Loews Theater (valid for one year): \$4.

Page 2

Astroworld (valid 1991 season): season, \$44.94; child less than 4 feet, \$10.12; one day, \$15.85; Waterworld, \$8.15.

Seaworld of Texas (valid 1991 season): child (3-11), \$12.25; adults, \$17.25. Six Flags (valid until Nov.): one-day, 15.95; child less than 4 feet, 14.95; two-day, 20.95.

Riverraft Trip (July 13 - includes bus transportation, a visit to Natural Bridge Caverns or Wild Life Ranch, rafting, and barbeque dinner): \$35.

Astros vs. Dodgers (1:35 p.m., Aug. 4 limited number of field level seats. Last day to buy is July 22): \$7.

Information coming soon for NASA Ski Week at Big Sky Montana Resort Jan. 4-11, 1992.

# JSC **Gilruth Center News**

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

Defensive driving---Course is offered from 8 a.m.-5 p.m., Aug. 10, Sept. 21, Oct. 12 or Nov. 6. Cost is \$15.

Aerobic dance-High/low-impact classes meet from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is \$24.

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

Weight safety-Required course for employees wishing to use the Gilruth weight room. The next class will be from 8-9:30 p.m. July 25 and Aug. 7. Cost is \$5.

Country and western dance-Six weeks of Monday night sessions begin June 17. Cost is \$20 per couple.

Aikido-Martial arts class meets Tuesdays for six weeks beginning Aug. 6. Cost is \$30 per person.

- Summer basketball league sign-up-7 a.m. July 15 and 16; non-badged teams 4:30 p.m. July 19.
- Summer volleyball league sign-up-7 a.m. July 17 and 18; non-badged teams 4:30 p.m. July 19.

Summer softball league sign-up-Week of July 23.

Please call x30304 or x35789, for specific dates of individual divisions within the leagues.

8639

\$7.8

Cycles

480-9376.

or 286-1212.

mi. ex cond. \$50, x36828 or 538-1627.

Boats & Planes

# JSC

- Property Rent: W Galv beach house, 2-2, hum, Ig deck, boat landing, mari-na wipool, sleeps 6, \$500Wk. Fondell, 486-1746 or 538-1147. Rent: Galv beach house on canal wiscoellent bay view 286-8558. Sale: LC:Newport, 5-2-2, decked patio, fenced, no MUD tax, \$72-5K. x3885 or 332-8937. Sale: 71 mobil home, 14'x70', 3-1.5, new paint, new carpet, fans, A/C-H, \$5K. 339-1337. Sale: LC 3-1.5-1, ex cond, assume wino approv, \$10K equity, \$58 etk. 554-7727. Sale: Agnola, TX, 86 acres, util avail, res lot, \$10K. Rob, x33484

- Sale: Magnolia, TX, .86 acres, util avail, res lot, \$10K. Rob, x33484

- \$56.9K, 554-7727. Sale: Magnola, TX, 86 acres, util avail, res lot, \$10K. Rob, x33484 or 461-6165. Sale: Meadowbend, 3-2-2 split, 2-4K sq ft, formal LR/DR, study, Ig family m, whitipool garden bath, Ig tot, x30382 or 334-1103. Sale: CLC University Green, exc townhome, 3-25-2, formal LR/DR, den, FPL, patio, deck, avail 7-1, \$98K, Hemman, x30955 or 488-1259. Lease: EL Dorado Trace condo, 2-2, FPL, W/D, wet bar, Jacuzzi, avail June, \$525/mo. 333-8707 or 480-4525. Sale: Leon County, TX, d01-wide mobile home, 3-2, 100+ acres. 332-8558. Sale: Trade: County Club estate lot, 60×110', 18 hole goit course, near Trinity on Lake Livingston, util avail, trade for lot of equal value in IC, Friendswood, or Akin area, \$10K 554-6841. Lease: Hentage Park, 3-2-2, 3 yrs old, no pets, eat in kitchen, FPL, formal DR, \$375/mo. 282-2787 or 532-1240. Sale: LaPorte, 3-2-2, FPL, spa, assume. Frank Jenson, x33838 or 470-1025. Lease: I-45 & LC, 3-1, needs work, \$395/mo. 332-0365. Lease: I-45 & LC, 3-1, needs work, \$395/mo. 332-0365. Lease: GL Shores, 3 BR, \$855/mo. Bill or Lisa, 538-1649. Sale: 30 Fleetwood mobile home widtached room, 3-2, 1400 sq ft, garden kitchen wibay window, wet bar, ex cond, avail Sept, \$12K, 331-7565. Rent: Med Cantter, 2 story condo, 2-1,5 CP, W/D, FPL, Ig kitchen, wit in detect order Mark SFE fore One 1027 201 027.

- 7565.
  Rent: Med Center, 2 story condo, 2-1.5-CP, W/D, FPL, Ig kitchen, walk in closesit, early Aug. \$675/mo. Charlie, 333-7804 or 799-9101.
  Lease: LC, 4-2-2, 2000 sq ft, FPL, fans, Ig fenced yard, deck.
  Richard, x31440 or 333-5693.
  Sale: CLC University Trace, 1-1-2, \$29.9K; Baywind II, 2-2-2, 39.9K.
  Gilbert or Lisa 333-4306.
  SaleLease: University Trace, 2-2 condo, refridg, fans, W/D hook-ups, res parking, non smoker, no pels, \$45K or \$\$25/mo. A88-5092.
  Lease: El Lago, 4-3-2 formal LR, den, fenced yard, avail 8-1, \$900/mo + deposit.353-2893.
- Cars & Trucks 86 Toyota 4 Runner, 4x4, ex cond, 4 cyl FI, 5 spd OD, 73K mi, \$7.3K OBO. Bob, 996-0393. 77 Ford E150 van, 351W eng, auto, A/C, \$2.2K. Bauch, x31309 or 392 9920 333-338
- Bob. 996-0393. ex cond, 4 dr, 4 cyl, It blue, A/C,

# Today

Spaceweek-Spaceweek '91, an international week of education and promotion for space activities around the world, will be observed July 16-24. This year's theme is "Look to the Heavens and Learn." For more information, call Spaceweek National Headquarters at 333-3627.

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

# Monday

Cafetería menu-Special: Italian cutlet. Entrees: braised beef ribs, chicken a la king, enchiladas with chili. Soup: cream of broccoli. Vegetables: navy beans, Brussels sprouts, whipped potatoes.

# Tuesday

Cafeteria menu-Special: stuffed cabbage. Entrees: turkey and dressing, round steak with hash browns. Soup: beef and barley. Vegetables: corn cobbette, okra and tomatoes, French beans.

# Wednesday

Cafeteria menu-Special: pepper steak. Entrees: catfish with hush puppies, roast pork with dressing. Soup: seafood gumbo. Vegetables: broccoli, macaroni and cheese, stewed tomatoes.

# Thursday

NCMA meeting—The National **Contract Management Association** will present a luncheon meeting at

11:30 a.m. July 18 at the Nassau Bay Hilton Marina Via on the Club level. The price is \$5 for advance ticket sales to members, \$6 for members at the door and \$10 for non-members. The program speaker will be John W. Aaron, manager of the Space Station Projects Office discussing "An Update On Space Station Freedom." Deadline for reservation is 4 p.m. July 12. For more information contact John Trahan, x30543, or Theresa Borrego, 282-6679.

**Dates & Data** 

AIAA forum — The American Institute of Aeronautics and Astronautics will present a forum at 11:30 a.m. July 18 at the Gilruth Center. The forum will be called "At the Threshold: Impacts of the Augustine Committee, Synthesis Group and Space Station Debate on America's Future in Space." The prices are \$7/members; \$8/non-members; and \$6/students. Reservations are due by noon July 15. For more information, contact Frank, 333-6064, (Lockheed); Carroll, 283-6000, (Eagle); or to reserve a space contact Sarah, 282-3160, (Bendix).

Cafeteria menu-Special: chicken fried steak. Entrees: beef tacos, barbecue ham steak, Hungarian goulash. Soup: turkey and vegetable. Vegetables: spinach, pinto beans, beets.

# Friday

Cafeteria menu-Special: tuna and noodle casserole. Entrees: liver and onions, deviled crabs, roast beef with dressing. Soup: seafood gumbo. Vegetables: whipped potatoes, peas, cauliflower.

# July 20

Loral Run — The Loral Lunar Rendezvous Run will be held at 8 a.m. July 20 at the Gilruth Center. Entry fee is \$10 if entry form postmarked by July 6, \$12 after July 13, and \$15 after July 14. Entry forms are available at the Gilruth Center gym office. Volunteers will be needed. Those interested should contact Len Topolski at 333-5576, or Brenda Clary at 480-0257.

Space Fest '91-The Houston Junior Chamber of Commerce will host "Space Fest '91" at 10 a.m. July 20 at the Rice Memorial Center (Rice Univ.). Admission is free. The purpose of "Space Fest '91" is to celebrate Houston's key role in past and continuing development of the Manned Space Center. For more information, contact Terry Jones, 529-2337.

# July 22

Spaceweek Banquet-Spaceweek will host a national banquet at 6:30 p.m. July 22, at the South Shore Harbour Resort and Conference Center, League City. The keynote speaker will be NASA Deputy Administrator J. R. Thompson with introductory remarks by JSC Director Aaron Cohen. Black Tie. Tickets \$45 if purchased before July 5, \$55 after. For sponsored table or to order tickets contact Spaceweek National Headquarters, 333-3627.

# July 23

BÁPCO meeting—The Bay Area PC Organization (BAPCO) will meet at 7:30 p.m., July 23, at the League City Bank and Trust, 303 E. Main, League City. The group is open to all persons with an interest in microcomputers. Contact Earl Rubenstein, x34807, or Tom Kelly, 996-5019, for information.

# <u>Swap Shop</u>

Bullet bass/case, ex cond \$300; Hammond M3 organ, good cond, \$595 474-3612 Apple IIC, 12" mon, ext dr, 300/1200 modem, mouse and assort-ment of SW incl Home Accountant, \$600. 538-1479. Sony car CD, \$280; Profile crossover Hammon Karden EQ, \$90 ea; Kerwood 140 watt car amp, \$130; 2 JVC amps \$100; Sanyo 100 watt, Yeo Ecide voice and the second se

\$80. Eddie, x34580 Nintendo Power pad w/one 3 game cart, \$50. 333-7180 or 333-9581

9581. Kilpsch K6-4 loud speakers under warr, ex cond, was \$763, now \$499. Trey x36759 or 992-1076. 286 AT IBM compa, 16MHz, 40 MB HD, 1 MB RAM, 144 MB 3.5" and 1.2 MB 5.25" FD's, 1 ser port, 10 AT kybd, EGA graphic card and mon, 2400 baud int modem, Logitech mouse, over \$1500 of SW, ex cond, \$1700. Fatonia x34890 or 590-7445. IBM-PC 512K 2 FD mono mon w/CGA card, \$300, 326-1417. CompuAdd 212 (IBM compa) PC w/HD and 5.25" FD, 40MB, MS DOS, Panisonic printer, ex cond, \$1.3K OBO, 534-3280.

### **Musical Instruments** ndy II alto saxophone, w/case, \$200. Scott, 488-5663 or 332-

- 3608 Zilozi
- 4608. 5 pc Ludwig drums, 22" bass, gloss blk, heavy duty hardware, 5 pc Ludwig drums, 22" bass, gloss blk, heavy duty hardware, 21 bound by the second wayne, 282-4349 or 430-3157. Magnitor elec guitar, ex cond, 535. 244-5843 or 532-2215. Yamaha FC-160 acoustic guitar, newly adj action, new strings, wcase, \$175. Todd, 282-3271. Construction on the second second

Lolus acoustic gultar wideae, \$160. 486-6890. Baldwin encore organ, model 130 series wireal rhythm, ex cond, incl music books, \$695 OBO. Gary, 280-2253 or Sheila, x37642.

## Pets & Livestock

- akeet w/cage, toys, food, and care bk, \$20. 282-3508 or 334-0582 Free sandy/cream colored kitten, short hair, tabby striped mate, litter
- trained. 282-3508 or 334-0582. Free Lab, black, 2.5 yrs. Kirk, 282-2911 or 332-5876. AKC Lhasa Apso, 10 mo, neutered, all shots, kennel, dog bowls, \$175. 488-5970 or 286-3019. Free cats, spayed, declawed, and housebroken, 1 white male, 1 black female. 326-5155. Quarterhorse gelding, 7 yrs old, trained used as cutting horse, Jenny x35981 or 484-3889. Mai Yorkehre Torde a pursion of white here applied. trained. 282-3508 or 334-0582

- Propeller, 19 pitch, fits Mercruiser I/O, recond, \$75, 286-3626. Lido-14 salibaa, salis, thr, \$995. R. Hoover, x31360 or 996-7716. Cactus saliboat, 10, good hull, two salis, trir, \$550. Steve, x35923 598-2169 Mini Yorkshire Terrier puppies, six wks old, \$250-\$300 ea. 532-1562 Beechcraft Debonair B33, 185 mph cnuise, stormscope, 3 axis autopilot, \$70/mr. Bryan, 282-4384 or (409) 740-7610.
   21 Sieekcraft jet boal, 425 Olds w/Berkley jet drive, \$1.5K OBO.
  - AKC Cocker puppies, champion line, shots/wormed, \$125 ea. Karen, 334-1058. AKC Cocker puppies, born 4/17/91, champion sire, all parti colors,
  - no m hm tabby 3 mos old or

king and queen beds, no matt/box springs. 282-4675 or 480-1356. Kenmore washer, wht, ig capacity, 1 yr, \$275; Kenmore elec dryer, wht, ig capacity, 1 yr, \$250 OBO for both. 355-2371 or 326-2783. Lazy Boy dual recliner, loveseat, ex cond, was \$800, now \$250. 482-5837.

paperwk and probe, \$100. Mark, x30131 or 488-0056. Precision ping eye II clones golf clubs, 1 PW, \$150, std length wistiff shaft, metal woods, \$25 ea. David, 554-6514. Sears trash compactor, ex cond, \$79. 486-8659. Cedar rowing single, built for \$4 Olympic at Hudson in London, Canada, ex cond, \$26 K, \$4305 or 326-3913. Stamps, 105, 29 cent for \$29, Jeff, 333-7010. Two Raleigh Rampar 27\* 10 spd bikes \$60 ea or \$100 both. Dennis, 538-1214. Kiin furniture and pottery wheel supplies, ig exec desk. 337-6406. Ouarter inch glass, various sz, \$1 s qf trone gal Hibuscus plants, \$3 ea; Magnolia tree, \$12,50 ea. 482-5226. Horse or cow skull, plain, can use for painting or decoration \$5 ea. Ronnie, 533-1649. Heavy duty weedeater 3/8 hp, good shape, \$20; shelf brackets, \$2 ea; stackable plastic storage shelf set, \$5,51 ck 34350. Wedding dress, gloves, hat, and shoes, all sz 8, cream colored, short sleeves, tea length, Southern Belle style, \$100. Sharyl, 481-4889. 15' bass boat '79 50 hp Johnson, trolling motor, depth finder, 2 chairs, 2 new batt, and trir, \$1.5K; Ig microwave, ex cond, \$200. x36171. Sears lifestyler 2100 treadmill, warr, \$260. 482-1505. US, coins, Indian cents to silver eagles, wilb zw or sell mint sets.

Lažy Boy dual recliner, loveseat, ex cond, was \$300, now \$250. 482-5837 BR suite, 3 yr old, ex cond, queen sz bed, three dnwr dresser wfutch mirror, five dnwr chest, two night stands, \$1K OBO. 282-4532 or 286-8524. Couch and loveseal, tan stripped, ex cond, \$100 OBO. 282-4736 or 286-8524. Dueen waterbed, \$100; 3'x6' wood exec desk, \$100; heavy-duty sheiring, \$50. (409) 849-3791. GE frost free, energy saver, refrig, almond, 17.2 cu ft, ex cond, \$200. Lorraine, 480-3377 ext 58 P Lennor china Elemal pattern, 9 plates, 7 cups, 7 saucers, 4 salad, \$350 indiv pos 25% off retail. Bob, x36442 or 474-3510. Kammore refrig wrice maker, whi, \$600; Kenmore heavy-duty Ig capacity, W0, whi, \$500 Stol ea. Greg, x30503 or 585-5108. Early American dol dresser, hutch, night stand, \$250; wood and brass daybed wftundie, \$250, David, X38947. Lazy Boy loveseat, dual recliner, ex cond, apriort, \$250, 482-5837. Couch, chair, wriotoman, ex cond, \$200; tull sz bed, windboard/matt \$65, rattan glass rectangular coffee tbi, \$30, rattan md dinelle tbl, wd chairs, ex cond, \$230; brass coat rack, \$5; brass cedar cubed chest, \$20. \$00/alt 480-2997.

Photographic Omega C760 lamphouse and enlarger sys, \$200; EO ONE analyz-er/equalizer, 10 bands ea channel, \$30. x35259 or 486-5565. Omega D 4x5 camera, wRoden stock 150 mm lens, hard carrying case, 6 film holders ig reflective dark cloth, \$750; Pentex Spot 5 meter, ex cond, \$100. 482-3432.

## Wanted

Want to buy paid in full Gold Charter or Premier Plus membership at President and First Lady Health club in Webster for \$150. Kevin, 283-0309. Want Honda or Yamaha scooler in good cond, 200 cc or larger. Jeff, 333-7010 or Dian, 448-5393. Want roommate to share 3-2-2 house in League City area, \$250 plus 1/3 util. Rob, 538-1449. Want windsuffing rig for beginner, prefer top name brand. 282-3215 or 480-9448. Want used window A/C, either two 110V units or one 220V unit, pay to \$75, working or not: 339-1337. Want used window A/C, either two 110V units or one 220V unit, pay to \$75, working or not: 339-1337. Want two g Advent speakers from the 70s, cabinets must be in ex cond. 488-0195. Want full sz bed for a 73 Chevy 1/2 ton PU. Mark, 488-4014. Want two matching wing back chairs; good stereo w/4 speakers. 283-0309

<sup>34</sup> Olds Ciera, new re-built eng, ex cond, 4 dr, 4 cyl, It blue, A/C, auto, 82.7K. 260-2192 or 480-6697. <sup>30</sup> Subaru Legacy LS, 4 dr, blk wran int, 4 wheel disk brakes, elec, sunroof, loaded. 38K mi, \$12K OBO, 860, 480-1225 or 474-4747. <sup>35</sup> Chev Celebrity wagon, auto, A/C, PS, PB, new tires, good cond, \$3K OBO. Anne, x39146 or 488-0803.

5450 or 689,2063

'88 Mitsubishi Mighty Max Sport, 5 spd, A/C, AM/FM/cass, ex cond, 53K mi, \$48K OBO. Adriann x34725 or 438-3824.

Son IIII, even UBU. Admann x34725 or 438-3824. '85 Chevy Silverado, 3/4 ton, 4x4 PU, loaded, w/topper, red w/bur-gandy interior, §55K. 283-5566 or 334-4124.

'83 VW GTI, bik, A/C, sunroof, roof rack. Andy, x32503 or 334-2647

'88 Isuzu I-Mark, whit, auto, A/C, AM/FM, 27K mi, ex cond, \$5,795.

Horz/10. 31 Chavelle, 4 dr, complete parts car, good A/C, P/S, auto trans, body, tires, 50K mi, bad 1.6 L motor, \$300 OBO. Denis, x33586 or 554-6122.

88 Lotus Espirit Turbo, red/tan, 18K mi, ex cond, \$42.5K. James, x31064 or 334-1766

85 Chev Celebrity wagon, A/T, A/C, P/S, P/R, new tires, good cond, \$3K OBO. Anne, x39146 or 488-0803.

Cond, 33K OBC, Anne, X39146 or 488-0803. '81 Volvo 244GL auto, A/C, P/S, P/B, 4 cyl, good tires, P/W, P/L, AM/FM/cass, met dk red, tan/bk int, sumod, \$3,5K. Tim, x33062. '80 Mazda 626, ex cond, 4 cyl, gold, Pioneer stereo, \$1.9K. (409)

925-808

'89 Ford Probe GT Turbo; ex cond, many extras, \$10,895. Dan, 280-2780 or 457-285

280-2780 or 457-2850.
80 Toyota Corona, not running, new tires/4 wheel brake job/ master cylinder, \$300; '83 Ford Escort wagon, not running, new tires, perfect body, \$500, im, x35852 or 474-7747.
82 Ford Anaheim custom van, P/S, P/B, AM/FM stereo, 4 capt chairs, sofa bed, 2 A/C, 2 tanks, CB, cruise, tit, BO. 488-3191.

Chairs, Sola Deol, 2 AVU, 2 Jamis, Vol, druslej, Ini, BU, 400-3191. 182 WW bus camper, not running (dissel), body good cond, \$1300 OBO, Enrique, 282-8551 or 554-4543. 188 Mazda 929, loaded, sunroof, 5 spd, ex cond, \$9895. 244-9843

or 532-2215.

71 VW van, rebuilt engine, brakes, good cond, \$2.1K. Bill Huber, x30039 or 332-9044

'78 Chevy Nova, runs good, new brakes, tires, and muffler, maroon, straight 6 cyl, \$900. 481-0494.

84 Mazda RX7, silver, 5 spd, A/C, cruise, 56K mi, ex cond, \$4,250. 335-2371 or 326-2783.

330-2471 of 326-2763. \*82 Datsun king cab PU, 107K mi, A/C, 5 spd, recent batt, multiler, alternator, shocks, front brakes, new tires, \$2,250 OBO; '80 Ford Fiesta, 97K mi, 4 spd, recent water pump, front brakes, voltage regula-

motor (needs work), \$900 OBO. Derek, x35063 or 337-4831

s boat 35 hn Johnson, Hummingh 9' Kayak w/paddle and life jacket, \$450 OBO. Jeff, 667-8100 or 486-3991 78. 18' Searav Seville, AM/FM, green/wht, 30 hp I/O Mercruiser,

tor, muffler, alternator, and new tires, 26/33 mpg. x35824 or 481-1543. '77 Cadillac DeVille, all power, 200 watt Ctarion stereo, \$1,650, 332-

71 Mustang, 6 cyl, new paint/tires, needs minor work, \$3K OBO. 71 Mustang, 6 cyl, new paint/tires, needs minor work, \$3K OBO. 787 Ford Tra-Tech cust van \_27K mi, capit chairs, \$12.5K. 554-6941. 787 Mazda RX7 under warr, 5 spd, A/C, AM/FM/cass, midnight blue, 57 er / 790 cites.

\$7.8K, 729-3158.
B4 BMW 528E, 83K mi, ex cond, \$6.5K OEO. 485-3490.
90 Nissan King Cab PU, 15K mi. 3 yrs/36K mi, \$8.9K. 485-3490.
79 Chevy Malibu wagon, auto, P/S, cruise, A/C, AM/F/M/cass, roof carrier, no rust, \$850 OEO. 333-6556 or 334-1994.
87 Ford F-150 Lariat PU, full sz, 57K mi, V-8, 4 spd, two tone, w/matching tool box, A/C, cruise, th, \$6.2K. 480-6544.
94 Subaru GL loaded, runs, 100K mi, \$850 OEO. 473-4148.
84 Carriaro, V-6, 5 spd, bik, 37K mi, new tires/battery, ex cond, \$3.9K. Karon, 244-9664.

44 Kawasaki G1-2, /50, 8./K m, ex cond, \$1.8K OBO. Shannon, x32646 or 484-5412.
 87 Kawasaki, KLR-650, multi-purpose, 6K mi, liquid cooled, elec start, ex cond, \$1.750, 282-3307 or 486-4016.
 80 Yamaha, 400XS, good cond, blk, windshield/ fairing, \$800.
 Bob A, x34409 or 393-1670.

Pacer exercise bike, w/tension control, speedometer/ odometer, low

3 wheel, 24" bike whasket, good cond, \$50 OBO; Sears 26" 3 spd bike, good cond, \$25 OBO. Nash, 280-2736. Schwin Twin tandem bike, good cond, \$250 OBO. P.J., 335-4204 or 286-1012.

Sears Heavy duty Catalina Lady, 28" bicycle, \$45, 532-1562. Ten sod man's bike, \$100, x32571 or 280-0031.

Men's 3 spd bike, only 22 mi, many access, \$75 OBO; one station-ary bike, disassembled \$25 OBO. 486-0926.

saki GPZ, 750, 8.7K mi, ex cond, \$1.8K OBO. Shannon,

b) 10 Searay Sevine, AM/r-M, green/wint, 30 np 10 Merchasin, rear view mirror, speedometer, boarding ladder, incl boat cover, tirk, was \$7,890, now \$6,690. Max Kilbourn x38127 or 482-7879. 76 20 Thompson, 185 hp PCM Ford 302 V8, 280 Volvo drive wspare prop, gal volat axle tit ftri, needs minor repair and tune up, \$2K OBD. x33654 or 482-0996.

Gulf Coast 20 Sailboat w/trlr, good cond, \$2,650. 485-7629. Sears OB motor, 3 hp, good cond, \$60 OBO. Nash, 260-2736. 187 blk/wht Sunrunner 17', 165 hp Volvo I/O, good cond, \$6.5K. 333-6871

Welkraft Airskit, 18.5' bowrider, Merc 165 hp t/O, galv trir, ss prop, AM/FM stereo/CB, ex cond, \$3.3K. 480-5583.

18' Höbie Cat, ready to sail, ex cond, ind thr, \$1.4K, 482-3963.
 18' Hobie Cat, ready to sail, ex cond, ind thr, \$1.4K, 482-3963.
 194 Invader, bowrider, Volvo A0125 I/O, depth recorder, CB, skis, life jackets, ropes, anchor, fire ext, ex cond, galv drive on str, \$5.5K.
 Mark, x30160 or 325-3004.

'81 Ski Natique Anniv model, 500 hrs, Tandum trir. 363-1480 Infinity 6'2" surlboard w/leash, \$100, Scott, 332-3608 or 488-5663

## **Audiovisual & Computers**

Latayette AM/FM stereo rec/amp, ex cond, \$75. Robert, x34397 or 333-1485. IBM port PC w/Epson pmtr, 640K, 2 HD, \$600 OBO. Molly, 282-4248.

Commodore 128D w/bit-in 1571 FD, Comm 1526 pmtr, Roland DG

4248.
Commodore 128D whit-in 1571 FD, Comm 1526 pmtr, Roland DG color monitor, modem, manuals, \$450, John, x38429 or 482-6536.
Apple IH-, wr80-col card, green mono mon, 5.25' Olivetti PR2300, ink-jet, assolded SW, \$300 OBO. Brandley, 331-0361.
XT clone computer, 20 MB HD, dual 360K floppy multi card, color RGB/CGA, pmtr, \$700, B60 A, x34409 or 339: 1670.
Apple IIe, 128K, 80 col, RGB mon, 2 FD, \$550 OBO. Joel, 262-3517 or 482-4247.
Software, educ, Word Scramble, Play & Learn, age 7-11, for IBM X clones, wimanual, \$25, Yourn, 283-4813.
Tosihka BD-7815 cogiev wicabinetistand, zoom, leiter, legal, paper up to 11x17, needs adjst, \$1K OBO. Bob, 480-1225 or 474-4747.
Commodore 128 wimon and 1571 FD, Star NX10 printer, SW and books, \$600. Jenny, x35981 or 484-3889.
80 MB Corner Dr wicontroller, \$350; 2400 baud modem w/SW, \$50; 400 MB corner of wicontroller, \$250; 240 baud modem w/SW, \$51; Intel AboveBoard 2 MB expanded memory, \$125; Epson prog 27xxx family, 4 proms soft, \$126; Theme netwrk card-blink, \$100; EGA Paradize wonder card, \$45; 1.44 MB FD, \$50; FD Controller, \$25; Epson FX80 printer, \$30, x36166.
Tascam 8 track 4 DBX 150's Tascam M30 mixer \$3250; Fender

4132.

Free kittens 3 fem. 1 male, 6 wks old, Laurie, x32558 or 992-5907 Mini Lop rabbits, pet to championship quality, \$17 to \$30. Gailo, 554-6200

Burmese python, approx 4' long, nice color/pattern, ex health, \$200 OBO 484-4111

## Household

BR set, dresser, mirror, desk, chair, full sz bkcase hoboard and frame, antique white and blue, \$250. x38163 or 486-0830.

Harne, amoute write and Dute, \$250, X38163 or 486-0830. Two chairs, \$10 ear queen sz solabad huntler's green writoral print, \$100; canopy bed frame, twin sz, \$30, 559-3133. Tappan dish washer, 4 yrs old, needs repair, \$50, David, x34395. Keinmöre gas stove, withbid, glass dr, \$75, Keinmöre refrig, 19 cu tt, whi, icemaker, \$253, x45262 or \$324184. New 6 of leak kitchen teathe wiredener multi-interact and the statematic statematics.

New 6 qt elec kitchen kettle w/crockery, multi purpose and slow cooker, \$20. Kyle x38628. Century fruitwood DR furniture, ex cond. 333-3254.

Bassett king sz 4 poster solid pine bed, 4 yr old boxspring and matt, sheets and comforter ind, \$400 OBO. Vanessa or J.C., 282-4563 or 943-8443

Ward's heavy duty W/D, almond, good cond, \$200 OBO. 480-3944. Sears Kenmore port dish washer, ex cond, \$450. x30333 or 471 2885.

Sleeper sofa, browns/tans/golds floral; 2 gold swivei rockers; all ex cond, x30333 or 471-2885.

Girls French Provencial head/footboard, desk w/hutch, chair, 4 drwr dresser and night stand, \$250. x36828 or 538-1627. Couch and loveseat, blue, ex cond, \$500; two crystal lamps, \$25

ea. 244-5035 or 334-4124. Whirlpool apt sz W/D stacked unit, \$275. Bob, 282-6890.

Recliner, Ig tan, good cond, \$150 OBO. 333-5227. Lg beige sofa w/curved back/arms, \$175. x32571 or 280-0031 5 pc sectional sofa w/ottoman, rich sable brown fabric, \$500; oak desk, solid wood, 5 drwr, 18x52, \$75, 480-6797.

b) Sectorial Subar Woldmin, Teth Sade Comminator, 500, data desk, solid wood, 5 drwr, 18x52, \$75, 490-6797. Queen sz motioniess waterbed, widual htrs, and lumber supports, 9 leg duo frame, all access, co cond, \$400, x3173 or 48-65546. Sofa and loveseat, good cond, \$175 both, 488-4412. Dinette 7 pc heavy laminate top, wood chairs and tressel, china huich, was \$565, now \$450 OBO, will separate. 337-5868. Chair, swivel, leather look vinyl, barrel back, orange, ex cond, \$75. 474-5610. Daybed w/popup trundel, new matt/frame, southwest style, was \$395, now \$215 OBO. 337-5868. Burkbeds, chest/desk, L-shape skeep and dress center, will separate, adv. was \$780, now \$340 or \$56 ea pc. 377-5868. Two chairs gold, ex cond, \$75. P.J. 335-4204 or 286-1212. DR tables and chairs, solid oak, solid cherry, solid maple, 4 poster

326-5155

Want used trail bike in ex cond. 250 cc or more... lim. 498-4198 •vani used van une in tex corror, zou oc or more, um, 488-4188. Wani roommates for big house on CL, boat sites, pool table, \$300 mo plus util, avail 8-1. Andy, x2503 or 334-2647. Want to buy U.S. coins, proof sets, mint sets, collections or single crins. 488-4859.

COINS. 488-4850

Want to buy survival paint pellet gun. Robert, 283-4135. Want Triangle Fraternity Alumni, any chapter, any year, unan mangie Fratemity Alumni, any chapter, any year, I oup forming for fun, friends, networking. Tim Eiler, x33062 Want GJ Joe figures. 464-8694. ar, local Alumni

Want dog run, approx size 5'x15'x6'. P.J., 335-4204 or 286-1212. Want house to lease, 3-2-2 in Galveston or Brazoria Co. 333-77 Brazoria Co. 333-7783 or 554-6063.

Want to rent/lease 3-2 home or apt in Alvin, (409) 849-3791

Wani Var 490 Toyota or other Japanese make truck wart cab, 5-spd, less than 100K mi. Mary. x31278 or 223-3425. Want Ford 1910/MF 240 tractor, low hours, ex cond, w/implements,

will pay \$3-\$4K. Rich. 333-6350

## Miscellaneous

Queen waterbed, w/bookcase hdbd, \$125; Murray 15 SP 19" Red Rider mountain bike, new, \$100; 79 Toyota PU, 4 spd, wht, w/canopy, \$800, x31618 or 286-2755.

Infinity Quantum Jr speakers, 12° 3 way, \$200 OBO; Recoton MTS / stereo decoder, \$100 OBO; Connelly comp II water ski w/case and # \$100 OBO, #07 2020 TV stereo decoder, \$100 OF vest, \$100 OBO. 997-2069.

10 sheets .5" plywd, \$5 ea; Honda 50 mini trail, \$20; 2, 12" woofers 60W max, \$10 ea; 10° bi saw w30°x30° cast iron bi, needs motor, \$25; Craftsman 5.0 big wheel self-propelled mower, \$30; 20° wood extension ladder, \$50. 482-3428.

Scuba advanced or underwater photography class on July 9, 13, 14, \$75; Flower Garden scuba trip better than Cozumel, special 3 day on the MV Fling, 12 dives, \$375, 480-3260. "85 tandem axle, 35' Hillsboro gooseneck horse trir, ex cond, \$4K.

Roy, x39162.

y, xos roz. Lawnmower/lawntractor riding 10hp needs repair, \$400. Richard,

Lawintowernawintactor noing 1 unip needs repair, \$400. Incharo, x31360 or 996-7716. Lee 10 ib. bottom pour metting pot, \$25; Lee 45 cal mold, 2 cal, 200 grain, SWC, turnole Lube, \$10; inget mold \$5; casting thermome-ter, \$15, all tor \$50. 282-8736 or 486-4369.

ter, s 16, all or 500, zoz-67.60 r 460-4369. Casio FX 7500 graphic calculator 26 memories, 10 prog storage areas, 4006 prog steps, 195 functions, compact design, manuals, ex cond, \$70 OBC). Sirger syst upright vacuum, \$40 or will trade for com-parable vacuum wiattachmis. Laurie, 283-5742.

Oriental rugs, new, several colors/styles 9'x13', \$100 ea. Brad, 37999 or 474-5609. x37999 or 47

Schwinn Air-Dyne ex bike, like new, w/less than 500 mi, \$599; Amana radar range microwave, dependable non-kypd controls, org

Black powder 50 cal Hawken rifle, ex cond, extras incl. x35852 or

You Proce Flobe Theorematics, new, Bo. 280-2780 of 457-2850.
 Ya, 25' self contained travel trir, full sz shower, A/C, refrig, stove, good cond. \$2,650 OBO. 339-1337.

Two 10 gal aquariums w/pumps and gravel filters, \$25 or \$15 ea. x38373 or 333-9296.

Office furniture, grey metal chair, arms, vinyl cover, \$25; desk lamp, lighting, \$15; card files, dbl dnwr, 3'x5", \$20; single, 5'x8", \$10. 474-5610.

chairs, 2 new batt, and trir, \$1.51K; Ig microwave, ex cond, \$200. x36171. Sears lifestyler 2100 treadmill, warr, \$260. 482-1505. U.S. coins, Indian cents to silver eagles, will buy or sell mint sets, proof sets, Morgans, Walkers, etc. 488-4859. Antique pictures, kg, \$30 ea; antique Bentwood chairs, \$50 wipads; two steepskin rugs, \$25 ea; handmade Peruvian decorated wipic-tures woven in rugs 4.5x5.5'; suitable for wall hanging, \$85; IBM elec typewriter key type, \$75; kg handcarved Tiki head, \$50; kg parmeter, all features incl dock, \$30, Murray 21° power lawnmower, rear grass catcher, \$120. 488-5564. 54° oval glass top patio tot w/umbrella \$80; 6' Ford Fleetside camper top, dark bl, hinted glass, front and side sliding/full view side windows, no bubble, alum, \$300. Bob, 554-5346. Toyota 14' wheels, fits M2 85-89 and Toyota FX-16, \$300 OBO. 538-1479. Hide-a-bed couch and loveseat, \$300; LR chairs, \$30/ea; reoliner, \$40; dinete tb, \$50; 23 yrs of bound National Geographics, \$23. Bill, x315 gord Probe Turbo GT wheels, new, BO. 280-2780 or 457-2850.

474-7747. Full sz traffic light, works, \$30: alum aircraft propellor, for decoration only, \$35; diamond soltaire ring, below retail. Paul, x37591. Remote color TV, not working; chest, playpen, stroller, rowing machine, exercise bike, doll house, 488-3191. Motorola ultra classic cellular phone wiextra batt pack and both 115v and 12v charges, was \$300, now \$550, 488-5019. Hardwood lumber, 5000°, crown, inside corner, chair rail. 282-4675 or 480-1356.

or 480-1356. President & First Lady Gold Charter Membership, was \$1.2K, now

President & Hist Lady Gold Charter Membership, was \$1.2k, now \$800 DBC. Pat, x35500 or 280-0394. Desk wichair, good cond, \$120 OBC. 280-9870. Astros tickets 5 mezzanine seats for July 21, Chicago Cubs, was \$50, now \$30, Jim, x35126. Rockwell 10" tbl saw, hvy duty, comm strength 2 hp motor, \$100 OBC. 339-1337. Deam traditional off cubs. 2 BW powersine or cond. \$100 OBC.

Ram traditional golf clubs, 3 PW, new grips, ex cond, \$100 OBO. Rich, x24818.

Hich, X34918. Ladies rings, TX ring w/6 diamonds, 25 pts, \$175; 4.5 ct pear amethyst w/2 diamonds, 6 pts, \$150. Bev, 283-9354. 4 wagon wheel rims for Ford F150 PU, \$40; answering machine \$40; wdeodisc player w/15 movies, \$100. Joe, x30526 or 484-3889.

Treadmill, non-elec, spd, distance, timer, tension, ex cond, \$80. 333-7182 or 333-9581.

Medium sz golf bag, ex cond, \$35. x31911 or 326-4175.

Wilson signature golf clubs and bag, left handed, 2-9 irons, 1 and 3 woods, putter, ex cond, \$70, 482-5837.

In-home alarm sys, two arm/disarm xmitters, activiated by personal code, warr, \$395. 996-0323.

Houston Rockets tickets, one half season, sec 226, seats K1 and K2, upper prom aisle seats behind Rockets bench, \$543. Mike, x39095 or 486-9876.

X3005 of 485-8876. Ford Mustang restoration parts; orig equip, AM radio, \$75; custom built chrome tir hitch, \$30; working starter, \$15; Sears util tirl , 6x6, sm tres, metal clamshell cover, \$200 OBO. Bob, x36442 or 474-3510.

sm tres, meta camsnel cover, s200 050, 500, 53042 of 474-510, 22° rear discharge lawmower 1 yr old, wigrass catcher, 35 hp, Briggs and Stratton, 16° rear wheels, 2 year warr, \$160; elec Weedeater, \$50. Georgia, x34734. RVC aiplane, completely buil Eagle, K&B, 45, Futaba 4-CM, 12v, elec starter, fuel and pumps. Todd, 282-3271.

Space shots trading cards, will trade or buy cards to complete series 1 set. Patrick, 282-3544.

Octogym exerciser \$40; scuba equip tank, regulator, mask, fins, snorkel, spear gun, knife and more. 488-5092.

Bar-size pool tbl, all access, sell or trade for good chest-type freez-er or motorcycle, 350 or larger. 473-4148.

work on bodice, full length train, long lace sleeves, ex cond, was \$800, now \$500. 482-3432.

Wedding dress, matching veil, sz 7, ivory, wlace overlay and bead

# Space Exploration Initiative

JSC's Synthesis Group member discusses the process and the product

[Editor's note: Doug Cooke, deputy manager of the Lunar and Mars Exploration Program Office, recently returned to JSC after a temporary assignment as a member of the Synthesis Group. That group's report, "America at the Threshold: America's Space Exploration Initiative" set forth four possible architectures, 14 technology initiatives and 10 policy recommendations that could shape space exploration and exploitation for the next century. In this interview, Cooke discusses the Synthesis Group, its processes and its conclusions.]

# **By Kelly Humphries**

Q: How was the Synthesis Group study different from the previous studies on the direction of space exploration?

A: It was aimed at trying to figure out what you do when you get there more than it was vehicles, habitats and hardware. It was directed more toward identifying accomplishments, which is an important way to look at space exploration. We probably haven't done that to the degree it was done in this report.

The charter was to take an independent look at space exploration, but in the process it became as much as anything an advocacy for the whole Space Exploration Initiative. In fact, the number one recommendation in the report is that SEI be the centerpiece of our strategic plan. I know we in this office believe that should be the case. It provides a long-range goal for NASA and the space community. I think NASA can really benefit from the focus that SEI provides for its programs.

# Q: How did you become involved?

A: I was asked to be on the Synthesis Group after negotiations between NASA and the Synthesis Group leaders. Synthesis was headed by Lt. Gen. Tom Stafford, who had two primary leaders of the effort. One of them was Lt. Gen. Sam Armstrong and the other was George Abbey, who used to be the head of Flight Crew Operations here. They went out and recruited widespread membership for the working group from NASA, the Department of Defense - from all branches of service, a good many of whom work in the Strategic Defense Initiative — and most of the Department of Energy labs. There also was a senior group, that consisted of people like Chris Kraft, Max Faget, Joe Shea, Don Kromer from the Air Force, Mike Griffin, Gen. Abrahamson, Lee Silver and Chuck Ordahl from McDonnell

Douglas. There's a list of them in the back of the report. They helped shape the direction we were going. Some of the senior members came through individually and talked to our various working groups as we worked on specific facets of the report.

Q: I take it you were one of the working troops up there?

A: Yes, I started the first Monday of September and came back to JSC at the end of March. I have been up there some since then, quite a bit actually, in preparation for the release of the report.

Through the end of November, most of the time was spent going

through what we called tutorials and briefings from various components of the aerospace community. These were a set of briefings that were given, primarily by people from NASA centers, on various aspects of the program — robotics, science, science from the Moon, science from Mars, space transportation, planet surface systems, trajectories and Mars mission time frames. We also had industry briefings, where all the major aerospace companies came in and gave their impressions of what SEI should be about. We also had briefings by DOD and

DOE, which were aimed primarily at the kind of technologies they had that might apply to SEI. Many other people who were interested in SEI, or who had an idea to sell, also talked to us.

Practically everybody who's ever thought about SEI came through at one time or another and talked to us about various aspects. We had Carl Sagan, Buzz Aldrin, Dr. Edward Teller, some people from Ocean Engineering. We had pitches on asteroids, tethers, solar power satellites, nuclear technologies, rail guns and anything you can remotely associate with

We had a number of briefings by people from this office on the mission aspects of doing the job. They had a pretty big impact on everybody in terms of the realization of how hard it is to go from here to Mars - what the trip lengths and stay times are. I don't think it was widely understood by the group at the start of the Synthesis Group activity how long the trip times would be. At least half the study time was spent orienting the group with the general background of space exploration.

# ${f Q}$ : There's a lot to digest, isn't there?

 ${f A}$ : There certainly is. There's the history of all the past programs - we had people coming in

and talking about lessons learned from Mercury, Gemini, Apollo, Skylab, every space program we've had. It was probably a once-in-a-lifetime opportunity to get the benefit of the knowlege of all the past experts who are still with us. It will be hard to duplicate that experience in the future.

**Q**: Were those meetings well documented?

A: We have hard copies of all the briefings that were given. In fact, we're making them available to the Technical Library here on site. It's a whole bookcase

full of briefing materials.

# Q: After the briefings what did you do?

A: Then we launched off on the wavpoint effort. Rather than start the effort by laying our mission scenarios and lists of required hardware for those missions, we developed scenarios of significant accomplishments that could be envisioned on Mars or on the Moon. These were called waypoints, and represented accomplishments that might be linked together to form meaningful mission architectures. They're building blocks for the four architectures. We had the observation waypoint that concentrated on astronomical achievements, we had an energy waypoint that focused on generating energy for use in space and back on Earth. We had a Mars waypoint with chemical engines and a Mars waypoint with nuclear engines. We had a waypoint that concentrated on science achievements. One of the waypoints was aimed at what you do on the Moon, in terms of testing systems and human capabilities, to get ready to go to Mars.

them who thought, "Why go back to the Moon? Why not just go straight to Mars?" But when we got into it more, the complexity sank in. They agreed 100 percent that you had to go back to the Moon to understand the human capabilities and the ability to maintain reliability of hardware for long periods of time and just to learn about the operational aspects of working in space for a long time.

Q: What was your role, specifically? Did you have a certain area that you were keyed in on?

 $\mathbf{A}$ : My primary role there was to be the NASA point of contact to get supporting data when it was needed. I worked in one of the waypoint groups, in nuclear propulsion for Mars. After the waypoints, we got into development of the architectures and I was in that group as well. There was a life science group, a propulsion group, a power group, a robotics group, a group that looked at benefits of SEI and how the benefits contribute to society.

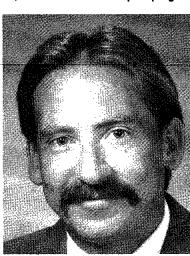
Then we all had a role in writing the report. After we had finished these group efforts and pretty well pulled together the information that was needed, we went through and divided aspects of the report and wrote up at least the initial drafts.

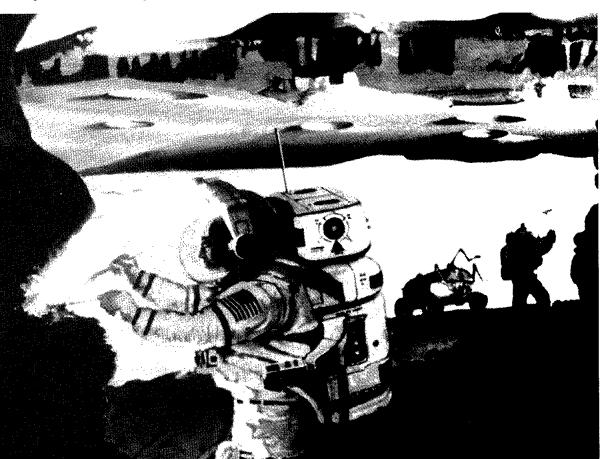
Q: Did the group work well together? Does the report really represent a consensus?

A: It was really a good effort. A lot of those folks came in there without a really good understanding of what the Space Exploration Initiative is, and probably hadn't thought about it too much. After it was over, there was a group of people that was totally committed to this as a strategic initiative for the country. In fact, most of them have gone back to their jobs and are trying to figure out ways to get involved in this program within their agencies. I would say we have a lot of new space exploration advocates.

Another thing that was very interesting to see was the excitement of people like Chris Kraft, Max Faget, Gen. Abrahamson, Joe Shea and a lot of other people who are past leaders of NASA. Having been in the Synthesis Group, I know we can call on them anytime and get them to look over our shoulders because they're all very interested. Tom Stafford said a number of times this was the most fun he'd had since Apollo, and he's done many interesting things since then. The group did work together well. I think most of the report represents a consensus. although like anything else if any one of us had been making the decisions, there are things we would do a little differently. Once again, there was a unanimous advocacy of the SEI.

Doug Cooke







Top: Astronauts collect Martian rock samples in an artist's concept depicting one of four architectures for exploration proposed by the Synthesis Group. Architecture I, "Mars Exploration," emphasizes Mars exploration and science with a lunar infrastructure developed only to the degree necessary to test and gain experience with Mars systems and operations. Right: Architecture II, "Science Emphasis for the Moon and Mars," depicted in this artist's concept of Martian science and exploration facilities, focuses on balanced scientific return from both the Moon and Mars. Global assessments of both bodies are made, and life science data required for Mars missions are generated through extensive operations on the Moon.

Synthesis Group Illustrations by Robert McCall

There were a good many briefings just on all

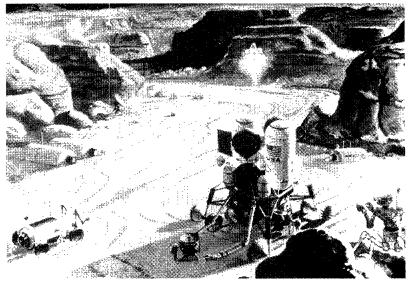
the background data that's been generated over time. It was primarily to bring this group up to speed because most of them had come from backgrounds where they had not dealt with SEI at all. Very few had, in fact. For the most part, they were coming in with fresh viewpoints.

> **Q**: Many people are still advocating a Mars mission without a return to the Moon. Why did the group feel a lunar component was necessary?

> A: It was very interesting because they had no preconceived notions of what it will take to go to Mars. There were a number of

Q: Where do we go from here?

A: One of the primary charges for the Synthesis Group was to come up with a number of architectures that NASA would study over a period of time. The intent was to identify a number of innovative alternative approaches to exploring the Moon and Mars, from which the administration could decide what the nation's future course should be in space. That was laid out by the Space Council. It was also to produce a set of high-priority technologies, early milestones and recommendations. We have already pulled from the report the essence of the recommendations, architectures and technologies. We will base our near-term work and assessments on these concepts.



# Fein leads State Bar law section

JSC Patent Counsel Ed Fein has been elected chairman of the Intellectual Property Law Section of the State Bar of Texas.

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Fein was chosen to head the section, composed of all 900 patent and copyright lawyers in Texas, at the annual meeting of the state bar association in Houston on June 22.

The section takes positions with respect to pending legislation or legal issues, and conducts continuing legal education classes for its members.

# **Professional secretaries** elect '91-'92 officers

Diana R. Peterson of JSC's Life Sciences Directorate has been elected president of the Clear Lake/ NASA Area chapter of Professional

# JSC mail service changes to oncea-day delivery

JSC mail delivery will become a once-a-day service throughout the center by the end of summer.

Because of continued constraints in resources and increased requirements affecting the mail service, JSC officials have found it necessarv to change the JSC mail pickup and processing schedules to accommodate a single daily delivery to all JSC facilities.

In the past, most JSC buildings have received two mail deliveries a day, one in the morning and one in the afternoon.

The change will go into effect through a phased implementation plan. The plan already has begun at some JSC facilities.

As of July 1: all JSC facilities in the 200, 300 and 400 areas; all JSC Ellington Field locations; and JSC offices in the Eagle, Atlas, Nova, and Vanguard buildings receive mail delivery between 1 p.m. and 2:45 p.m. daily.

Effective Monday, JSC buildings 12, 30 and 45 will receive mail delivery between 9 a.m. and 10 a.m. Effective Aug. 1, JSC buildings 1, 2, 4, 5, 7, 14, 25, 32, 33, 35, 36, 41, 44, 49, 210 and T585 will receive mail delivery between 9 a.m. and 10:30 a.m. All other JSC buildings will receive mail delivery between 1 p.m. and 2:45 p.m.

JSC officials said it may be necessary to periodically adjust this schedule to conform to facility changes and the addition of new facilities. All delivery points will reflect the delivery schedule for that location.

Any outgoing mail that needs to be processed by the U.S. Postal Service will be taken to the Nassau Bay Post Office each day at 11:45 a.m. and 4 p.m. All outgoing mail received at the Bldg. 1 Mail Center by 2 p.m. or the Bldg. 227 Mail Processing Facility by 3 p.m. will be included with mail going to the Nassau Bay Post Office at 4 p.m.

Questions concerning the mail delivery schedules and associated services should be directed to Kochetia Morman at x38481.

Secretaries International.

She was one of several new officers elected recently for 1991-1992.



Geneva L. Smith of Houston Lighting & Power was selected as vice president. Karen Byrd of Gail Davis Personnel is secretary, and Bernice Woolsey of Blackburn Marine is treasurer.

JSC committee chairs are: Cynthia Thomasen, arrangements; Elaine Kemp, bulletin; Estella Gillette, program and CPS society; and Carol Young, publicity.

# McGregor wins radio control flying meet

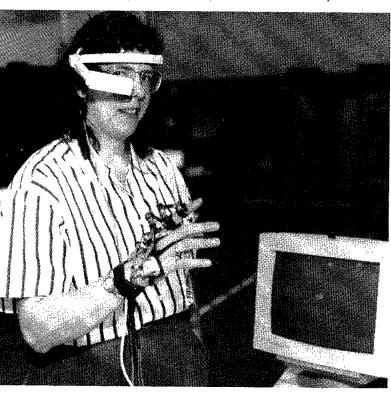
Darrel McGregor, a JSC crew training team leader, recently won the overall trophy at the JSC Radio Control Club's June Fun-Fly.

McGregor, a Rockwell Space Operations Co. employee, won two radio-controlled airplane events. Second place went to Charles Copeland, and third to Ed Copeland.

The club meets on the second Thursday of each month, and has a fun fly the following Sunday. Call Charles Copeland at 532-1570 for more information.

# O'Connell top secretary

Mary V. O'Connell, the Exchange Operations assistant responsible for



JSC Photo by Bill Blunck

Dr. Beth Marcus, president of Exos, Inc., demonstrates the Dexterous Hand Master, a sensor-lined exoskeleton that measures the joint movements of the human hand, during the Space Operations, Applications and Research (SOAR) workshop that was held in the Gilruth Center this week. SOAR was co-sponsored by the U.S. Air Force and NASA as part of Air Force/NASA Space Technology Interdependency Group activities. Speakers and technical papers were featured at the workshop in addition to hardware demonstrations and exhibits.

# T-38A aircraft avionics upgrade

flight evaluation.

A brief ceremony to recognize those

responsible for the modification pro-

gram is planned for 2 p.m. Tuesday

near Hangar 276 at Ellington Field

where the aircraft will be on display.

Buffalo, NY, performed the modifica-

tion. The upgrade's main features

include the addition of a weather radar,

a flight management system, and an

improved cockpit layout. Other

changes include an altitude alert sys-

Sierra Research Division of LTV in

Employees are invited to attend.

# By Barbara Schwartz

One of NASA's 28 T-38A aircraft officially will re-enter the NASA fleet Tuesday following avionics upgrading and the event will be marked with a ceremony Tuesday at Ellington Field.

The aircraft upgrading is part of NASA's plans to modify its entire fleet of 28 T-38A aircraft with modern avionics equipment to enhance flight safety and improve system reliability.

The first prototype modification was completed on NASA 912 in May, and the first flight was accomplished successfully on May 29.

tem, an outside air temperature probe, Initial checkout of the aircraft went and a voice-activated intercom system. well, and it was delivered to Johnson Astronauts will receive ground training and a short flight syllabus for Space Center at Ellington Field June 14. Since then, NASA test pilots and familiarization before they being regsystems engineers have been workular flights. The T-38A's are used by ing on completing the acceptance astronauts to maintain their jet airinspection and conducting a formal craft flying proficiency

# Peterson McGregor O'Connell

providing secretarial support to the NASA Exchange Operations Manager, recently received the Marilyn J. Bockting Award for Secretarial Excellence.

O'Connell is responsible for dayto-day activities relating to the NASA Employee Benefit Association, the NASA College Scholarship Fund, and the center's Combined Federal Campaign and Savings Bond drives.

She was cited specifically for her ability to handle those activities while balancing numerous special activities. One example of those special activities was the assumption of the duties of a departing NEBA clerk, including policies and procedures, billion methods and cross-checks.

She received a plaque from JSC Director Aaron Cohen and a \$500 stipend.

# Spaceweek 1991 salutes nation's space leaders

(Continued from Page 1)

For more information about the art and model building contests contact Diana Dinh at 729-9010. Admission is free to Space Fest and attendees should use the university's entrance eight on Rice Blvd. Scheduled to appear at Space Fest are: Astronaut Bernard Harris; Houston Mayor Kathy Whitmire; and U.S. Senator Lloyd Bentsen. Fred Alcorn, director of Orbital Sciences Corp. and former director of the Space Foundation, will chair the event. The Houston Junior Chamber of Commerce is sponsoring the event which is free of charge and open to the public. Refreshments will be available. For more information call 529-2337.

'The world benefits from space exploration in many areas such as medicine, education, transportation and communications," said Terry Jones, Space Fest chairman. "Space Fest 1991 will highlight the progress of space exploration.

A model rocket launch is scheduled for 1:30-3:30 p.m. July 20 at Johnson Space Center. If it should rain, the launch would be rescheduled for July 21. Organizers said that more than 100 model rockets will be launched. Admission to this event, which is sponsored by the Houston Rocket Club, also is free. For more information call 335-2246.

The new Bay Area YMCA will be the site of the Lunar Rendezvous Festival July 20. The day's festivities will begin with a children's Olympics event from 8-11 a.m. for children aged three years to 13 years. There is a \$3 entry fee. The Family Fun Fair will be held from 10 a.m. to 4 p.m. and there is no charge. The YMCA's grand opening and ribbon cutting will be at 11 a.m.. The YMCA is located on Highway 3 near Pineloch. For more information, call 480-2605.

The Houston Space Society, a nonprofit group promoting space development, is sponsoring tours of the Space Bus mobile classroom which features hands on activities for children. The bus will be at Jeremy's Book Store located on Bay Area Blvd. at Space Center Blvd. from noon to 6 p.m. July 21. Jeremy's will donate 20 percent of its day's book sales to buy science equipment for the bus which will serve the Clear Creek Independent School District's 16 elementary schools starting this fall. Call 486-4747 or 283-3530 for more information.

The Fiesta store on I-45 and NASA Road One will display tomatoes from seeds flown in space throughout Spaceweek. The Civil Air Patrol is sponsoring this event and more information is available by calling 546-2050.

# Hurricane season is here

# By Kari Fluegel

Whether it comes as Bob, Claudette, Fabian, Grace, Henri or Odette, a hurricane can devastate homes, businesses and people

Alicia, which hit in 1983, resulted in a cleanup and repair operation at JSC costing about \$2.3 million. Thus, it is understandable when awareness of weather patterns in the Gulf of Mexico heightens as hurricane season begins.

The first step in preparing for a hurricane should be taken well in advance of any tropical storm development.

To assist JSC employees in assessing their preparedness, a video titled "Advice from Your Neighbors" will air on JSC closed-circuit television beginning Monday and continue through July 26. The video, produced by Rohm and Haas Texas, documents previous severe hurricanes and offers suggestions from area emergency managers. The video encourages residents to develop a personal plan of action and dispels some myths about hurricane protection for homeowners

great enough, JSC Director Aaron Cohen would decide when to close the center and begin evacuation of all non-essential personnel.

When the evacuation begins, storm preparedness moves to Level III.

JSC has two recorded services that carry hurricane activities information: the Emergency Information Line, x33351, which provides potential storm information, plans for safeguarding work areas, and information throughout the year on other area emergencies; and the Employee Information Service, x36765, which provides information about closings during hurricane season as they are announced.

July 12, 1991

Fein

# **NASA retires Super Guppy aircraft**

# By Barbara Schwartz

NASA's 940 "Super Guppy," a whale-shaped cargo aircraft that is the world's largest aircraft in terms of cubic capacity, has entered retirement.

NASA managers decided to retire the "Super Guppy" because the aircraft needs four new engines, and this requires strengthening the wings at a total cost of \$6-10 million.

"It's like a flying dinosaur," said pilot Frank Marlow.

Marlow and copilot Arthur "Ace" Beall flew the "Super Guppy" to Davis-Monthan AFB, Ariz., July 9, for long-term storage. Flight engineers on the trip were Chuck Gillespie and Henry Marshall.

The outsized aircraft presents unique flying challenges for the crew. Because of its shape, the Guppy lands differently from most aircraft in that its nose gear touch-

es down first and its nose gear leaves the runway last during takeoff

NASA purchased the "Super-Guppy," a highly modified Boeing KC-97, in 1979 from Aero Spacelines, Inc., in Santa Barbara, California, for \$2.8 million. It specifically was designed for carrying outsized cargoes such as the S-IVB stage of the Saturn V launch vehicle and the Lunar Excursion Module Adapter for the Apollo Program.

"It was a bargain," Marlow said, referring to the original cost as well as the benefits derived from being able to use the "Super Guppy" to carry more than two million pounds of NASA cargo during its years of service

Marlow said Dr. Werner von Braun, one of the pioneers of modern rocketry and Director of Marshall Space Flight Center at

that time, was one of the first people to fly in the "Super Guppy.

NASA has used the aircraft mainly for space shuttle cargo transportation, including the Hubble Space Telescope, Syncom satellites, Atlas-Centaur boosters, solid rocket booster aft skirts, and shuttle orbital maneuvering system pods. Other items transported were parts for Langley's National Transonic Facility, full-scale training equipment for use in JSC's Weightless Environment Training Facility, and F-14's for the Navy.

"We hate to lose this unique vehicle, but today our budget will not permit us to maintain the aircraft in a safe, flyable condition." said Donald Puddy, JSC's director of Flight Crew Operations. "In the future we will use specially modified Air Force C-5A's to transport shuttle and Space Station equipment."

The 27-minute video will air Monday through Friday at 9 a.m. on Channel 5.

JSC has a comprehensive hurricane plan to protect center facilities. The center moved to action Level I - a state of continual preparedness June 1, the official start of hurricane season.

If a hurricane threatens the Clear Lake area, JSC storm preparedness plans move to a Level II status and, at the discretion of Center Operations Director Ken Gilbreath, officials would open a hurricane command post in Bldg. 30. If the threat is

Center personnel will be notified when to return to work through the information services and radio and television reports.

Employees should secure their own work areas prior to evacuation. Such preparations include unplugging computer terminals and covering them with plastic bags, raising blinds to prevent additional wind damage should windows break, storing classified and other important materials in safe areas, and closing all doors

Each JSC organization has a designated emergency planning representative and an alternate who is kept informed on the status of the action levels during a hurricane alert and have information on preparing for a hurricane. A group of about 13 area protection teams ready JSC's grounds for a storm - checking buildings, picking up loose objects outside, and securing possible hazards.

For more information about hurricane preparedness, contact Robert T. Gaffney, the JSC Emergency Planning Officer, at x34706.

NASA-JSC