



ROUNDUP

NASA LYNDON B. JOHNSON SPACE CENTER

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SPACELAB MODEL — Ron G. Thory, left, European Space Agency resident at JSC, presents a 1/50th-scale model of the European Spacelab to Center Dir. Dr. Christopher C. Kraft Jr. Thory said the model was "a token of appreciation for the opportunity (for ESA) to participate in the manned space program" and that Spacelab would hopefully be the forerunner of other collaborative efforts. Similar models were given to Robert F. Thompson, Shuttle Program manager, and Cliff E. Charlesworth, acting manager, Shuttle Payload Integration & Development Office.

McDonnell Douglas receives Spacelab integration contract

NASA has selected McDonnell Douglas Technical Services Co. Inc., Spacelab Integration Division, Huntsville, Ala., for the award of a contract for Spacelab integration.

The period of performance of the contract will be from March 1977 through December 1983, including an option period beginning April 1981. The contract is cost-plus-award-fee type with an estimated total value of \$43.5 million.

The integration contract is for the design, development and fabrication of most of the Spacelab hardware for which NASA is responsible. This includes the crew transfer tunnel, verification flight instrumentation, mockups and

ground support equipment.

Also included are systems engineering and integration efforts necessary to develop Spacelab operational capability. Integration involves tasks in systems engineering, analytical experiment integration, software development, launch operations and logistics.

Spacelab is being produced in Europe by the European Space Agency (ESA).

Designed for at least 50 missions, Spacelab will carry payloads for Earth observation, materials science, physics, life sciences, communications, navigation and space systems.

The laboratory will be carried to

and from Earth orbit in the cargo bay of the Space Shuttle and will remain attached to the Shuttle throughout the mission.

Spacelab will be composed of a pressurized module or pallets on which equipment can be mounted for direct exposure to the space environment, or a combination of module and pallets. Scientists and technicians can work inside the pressurized module without space suits.

Part of the work under this integration contract will be performed at NASA's Marshall Space Flight Center, Huntsville, Ala., and the remainder at the Kennedy Space Center, Fla., the latter being one of two launch sites for Shuttle flights.

Increased planetary knowledge shifts Lunar Conference focus

Planetary knowledge was highlighted at the 8th Lunar Science Conference held at JSC March 14 - 18. Continuing a trend begun at last year's conference, lunar and planetary scientists presented findings of Earth-based, orbital and, in the case of Venus and Mars, lander experiments on terrestrial planets.

The evolution of the Lunar Science Conferences into planetary science meetings has followed rather closely the actual exploration of the planets by NASA spacecraft. For this year's conference the Viking Mars landings had a significant impact, as did the Venera landings by the USSR on Venus.

Final figures showed 665 scientists from 14 nations in attendance including the first sizeable group ever from the Soviet Union.

The Soviet group, led by Corresponding Academician V. L. Barsukov, presented preliminary findings of the Luna 24 mission of last year. Luna 24 sampled and re-

turned a portion of Mare Crisium on the Moon's easternmost limb.

In addition to the Luna findings, the Soviets discussed preliminary data on the surface chemistry and morphology of Venus based on their Venera probes.

The Soviets also presented additional Luna 24 samples to NASA in ceremonies with Dr. Noel Hinners, associate administrator for Space Science and Dr. Barsukov, director of Moscow's V. I. Vernadsky Institute. Hinners praised the Soviet Union's continuing lunar exploration program and their earnest scientific cooperation with NASA.

In addition to the seven main conference topics, three special sessions focused: on Mars, based on the Viking data and presented by members of the Viking science teams; on new data interpretation techniques for orbital planetary data, presented by USGS Flagstaff Astrogeology scientists, and on "new moons," when scientists from many disciplines explored the possi-

bilities and advantages of towing asteroids into Earth orbit for exploration and exploitation.

The new moons session parallels closely a special session held last year on the use of lunar resources for lunar base and geo-synchronous satellite construction.

The key to the new moons program is the development of a special linear induction engine presently being studied by MIT under NASA grant. The "mass driver," or electromagnetic slingshot, would use asteroid material as propellant to drive the asteroid through space.



SMILES OF COOPERATION — Dr. Noel Hinners, left, NASA associate administrator for Space Science, and Dr. V. L. Barsukov, center, corresponding academician representing the Soviet space program, smile and shake hands during the presentation to NASA of a lunar sample collected last August by the USSR Luna 24 spacecraft. Barsukov made the presentation on behalf of the Soviet Academy of Science during the Lunar Science Conference. JSC Language Officer Nicholas Timacheff is standing at right.

First HEAO orbiting observatory scheduled for launch on April 15

The first of three orbiting observatories which will allow astronomers to lift their instruments above the Earth's distorting atmosphere is scheduled for launch by NASA on April 15.

The High-Energy Astronomy Observatory-A (HEAO-A) will be launched on an Atlas Centaur from Cape Canaveral at 12:45 a.m.

The HEAO weighs nearly three tons and consists of two parts, an experiments module and the spacecraft module.

Four highly-specialized experiments aboard HEAO-A are designed to survey and map X-ray sources throughout the celestial sphere.

Once in space, the satellite will rotate slowly, scanning the cosmos and mapping everything it observes—pulsars, quasars, supernovae and black holes.

One of the experiments is a large area X-ray survey instrument for locating X-ray sources and to provide spectral data for use in the study of the physics and evolution of energy sources.

A second cosmic X-ray experiment measures emissions and absorptions of diffuse X-rays and correlates results with radio and visible light ray emission.

The third experiment is a scanning modulation collimator to determine the precise celestial position of selected cosmic X-ray sources and to investigate their size and structure.

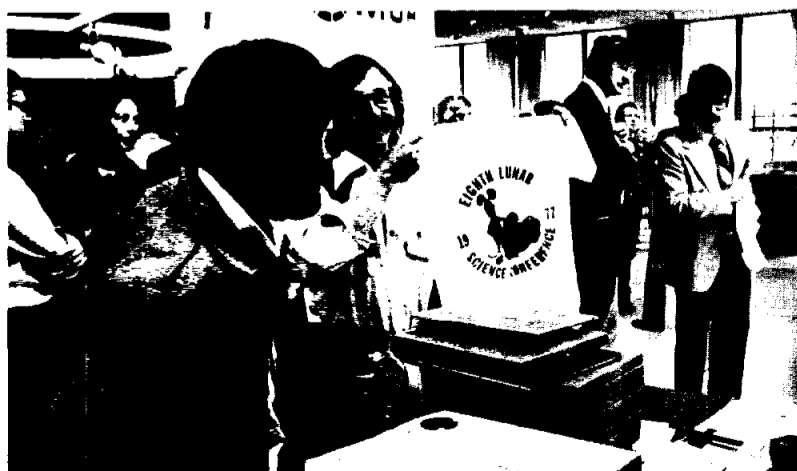
The fourth instrument on HEAO-A, a hard X-ray and low-energy gamma ray experiment, will determine the position, spectrum and time variations, intensity and

other properties of certain X-rays and gamma rays.

The Atlas/Centaur launch vehicle will place the observatory in a circular orbit of approximately 376 kilometers (235 miles) above Earth, above the obscuring effects of the atmosphere and below the belts of trapped radiation which would interfere with measuring stellar radiation. HEAO-B is scheduled for launch in 1978 and HEAO-C in 1979.

Five days after HEAO-A is propelled into orbit, NASA is scheduled to launch (April 20) the Geodynamic Experimental Ocean Satellite-D (GEOS-D) for the European Space Agency.

That satellite will test the effectiveness of newly-developed instruments in monitoring ocean topography and observing the sea state.



LATEST LUNAR FASHION — Youth fashion fads have even infiltrated the scientific community. Here, participants at the recent Lunar Science Conference inspect a T-shirt which promises to be a "must" in leisure wear for the well-dressed lunar and planetary scientists.



CASHWINNERS — Receiving \$400 awards each for their work on the Orbiter Nomex Felt Thermal Protection System were ten Structures & Mechanics Division employees. Seated, l to r, are award winners Jack Naimer, George Strouhal, James A. Smith and Lubert J. Leger. Standing, l to r, are winners Robert J. Maraia, Donald J. Tillian, Ivan K. Spiker,

Robert L. Dotts and William C. Schneider; Center Dir. Dr. Christopher C. Kraft Jr., Orbiter Project Deputy Mgr. Milton Silveira, Structures & Mechanics Div. Chief Robert E. Vale, Engineering & Development Director Dr. Maxime A. Faget and E&D Asst. Dir. Aleck C. Bond. Not pictured is award winner William D. Sherborne.

Ten employees receive awards for thermal protection system

Ten employees of the Structures and Mechanics Division have received awards of \$400 each for their contributions leading to the development of the Nomex Felt Thermal Protection System for the Shuttle Orbiter.

The JSC employees were chosen for recognition by the NASA Inventions and Contributions Board. Presentation of the awards was made recently by Center Director Dr. Christopher C. Kraft Jr.

Cited for their achievements were Robert L. Dotts, Lubert J. Leger, Robert J. Maraia, Jack Naimer, William C. Schneider, William D. Sherborne, James A. Smith, Ivan K. Spiker, George Strouhal and Donald J. Tillian.

The proposal for the award was submitted in October 1975 after an evaluation by Milton Silveira and approval by Aaron Cohen, deputy manager and manager, respectively, of the Orbiter Project Office.

In his evaluation, Silveira described "cost savings in the order of \$3-5 million, weight savings of approximately 1,000 pounds."

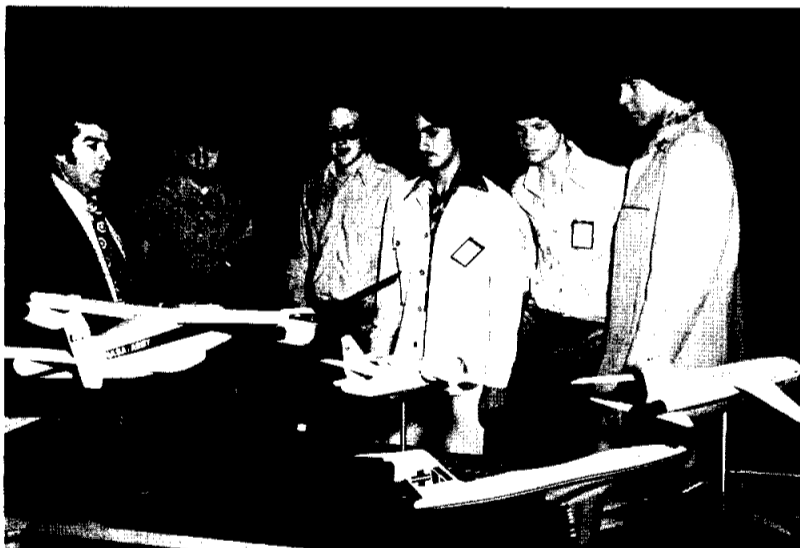
Cohen called the development "a truly outstanding piece of work" which "contributed a great deal to the Orbiter Program."

The low-cost thermal protection system (TPS) was designed to replace the baseline low temperature reusable surface insulation (LRSI) in areas of low heating on the Orbiter.

"The contributors determined that a coated, pretreated Nomex felt system could be used to replace the LRSI in areas of the Orbiter where the surface temperatures will

be (up to) 750 degrees F during ascent heating and...700 degrees during entry heating," the award description stated.

Basic advantages of the Nomex felt TPS are lighter weight, convenience of application in large sheets approximately 3'X6' rather than 8"X8" tiles, lesser susceptibility to damage and cost savings. The system was implemented in May 1975.



STUDENT ACHIEVERS — JSC Education Specialist Jim Poindexter shows aircraft models to a group of students who were Houston area Science and Engineering Fair winners of NASA Certificates of Achievement during the 1975-76 school year. The young men recently spent a day at the center. From left are: Poindexter; Mike Stubblefield, Pershing Junior HS; Steve Stockman, Spring HS; Steve Schramm, Clear Lake HS; Jim Harris, Clear Lake HS, and David Lippke, Angleton HS.

David Speller chosen 'Co-op of the Month'

David Speller, a junior mechanical engineering major from the University of Cincinnati, has been chosen JSC Cooperative Education Student of the Month for April.

Speller is completing his third co-op quarter here and is assigned to the Design Section, Spacecraft Design Division. He was nominated for the award by his section head, William K. Creasy.

"For the present co-op work session, Dave was given the task to design an energy attenuator for an orbiter payload handling system," Creasy said.

"From a concept sketch and a list of interface requirements he has, with a minimum of guidance, produced a set of detail design drawings, in conformance with design standards and specifications unfamiliar to him, of a double-acting hydraulically-damped attenuator which meets the required critical interfaces.

"In conducting the necessary analysis," Creasy said, "Dave was willing and eager to explore subjects and techniques which had not

been experienced in his formal education. Also, he willingly explored methods of fabrication for difficult components and has continually sought ways to improve his designs.

Chapman succeeds Snaveley

Maj. Gen. Kenneth R. Chapman, USAF (Ret.), has been named assistant administrator for NASA's Office of DOD and Interagency Affairs effective today, April 1.

Chapman succeeds Lt. Gen. William W. Snaveley, USAF (Ret.), who left NASA in September 1976 to accept a position in Saudi Arabia.

Chapman comes to NASA from the Nuclear Regulatory Commission where he has been director of the Office of Nuclear Material Safety and Safeguards since he retired from the Air Force in 1975.

JSC student workers earn project awards

Three E. E. Worthing High School seniors working at JSC won awards last month in the annual Student-Selected Jobs Competition of the Industrial Cooperative Training program for District 3.

Michael Jenkins and Jackie Lillie won first place ribbons for the individual projects each designed and built. They will advance to state competition.

Michael Branch took second place honors for his efforts. All three students work in the Technical Services Division.

Jenkins, who also attends night classes at Houston Community College, is working in the Instrument Machine Section. His project was a stainless steel tapping tool.

Lillie, of the Heavy Machine Sec-

tion, designed and built a mill stop device to reduce the number of times a machine is reset during a particular job.

Branch, working in the Sheet-metal and Welding sections, won his ribbon for an aluminum table top tool chest.

The competition was held March 11-12 at Spring Wood High School. Students from 26 high schools participated in the contest.

On the basis of their projects, Jenkins and Lillie qualified for the State Vocational Industrial Clubs of America competition scheduled April 28-30 in Fort Worth.

"Last year we placed second in state competition," Lillie said. "This year we plan to go all the way."

Applicants total 1,911

The Astronaut Candidate Program Office reported March 21 that 1,911 applications have been received for civilian astronaut pilot and mission specialist candidate positions. Of those, 241 were from women.

Of a total 14,053 applications

and announcements mailed out by request, 231 went to JSC employees.

Civilian applications must be postmarked no later than June 30, 1977. For information, write the Astronaut Candidate Office, Code AHX.

Length of Service Awards



BAILEY (35)



GARRISON (35)



HERRMANN (35)



HOBOKAN (35)



PARMENTER (35)



ALGRANTI (30)



HOFFMAN (30)



JOHNSON (30)



MOORE (30)



PILAND (30)



RUSSELL (30)



STROUP (30)

LONG-TIME EMPLOYEES — Thirty-five JSC employees received service awards March 1, presented by Center Dir. Dr. Christopher C. Kraft Jr. Employees with 35 years' service, above, are Glenn F. Bailey, Arthur E. Garrison, Ralph F. Herrmann, Andrew Hobokan, Frank L. Parmenter and (not

shown) James T. Duff. With 30 years' service, above, are Joseph S. Algranti, John R. Hoffman, Edward S. Johnson, James R. Moore, Robert O. Piland, Walter R. Russell, James Stroup and (not shown) Walter J. Kliner. Twenty-one persons received 25 year awards

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Photographer: A. "Pat" Patnesky

EAA ATTRACTIONS

TICKETS

The following tickets are available at the Bldg. 11 Exchange Store from 10 a.m.-2p.m., Monday - Friday:

Houston Aeros - EAA discount gift coupons may be exchanged at the Summit box office for "live" tickets on the night of the game. A \$6.50 coupon gets you an \$8 ticket, \$5.50 gets a \$7 ticket and \$4 gets a \$5 ticket. Aeros play Cincinnati, April 1 and San Diego, April 5.

ABC Interstate Theaters - \$1.50 admission tickets now available.

Dean Goss Dinner Theater - Comedy production, *The Lady Who Cried 'Fox'*, \$16/couple. Tickets available every night except Monday, Saturday.

Sea-Arama Marineworld - Tickets on sale, \$3.75 for adults, \$2.50 for children. Open until dusk year-round.

Marietta's Dinner Theater - Royal Coach Inn, Southwest Freeway. Tickets \$8/person good Tues/Weds/Thurs/Sun. Call Ms. Royal,

621-5957, tell here you're from JSC. Get ticket and pay at theater on night of play.

Astroworld - Reopens weekends March 12. Tickets available March 7 at \$6.95 for adults and children. That's a \$1 discount.

Six Flag - Open weekends beginning March 19. Adult and Children tickets, \$6.75 each.

EASTER EGG HUNT

Don't forget the EAA Children's Easter Egg Hunt tomorrow, April 2, at 1 p.m. at the Gilruth Recreation Center. The limited supply of tickets may be sold out by now but you can check the Bldg. 11 Exchange Store. They are 50 cents each for kids 2-8 years and it's BYOB (bring your own basket).

SADIE HAWKINS' PICNIC

The EAA-sponsored Sadie Hawkins' Day Picnic is coming up at the Gilruth Center on May 7. That date is firm. Rain or shine, the picnic will be held.

There are two ticket prices: \$1 for general admission; \$3 for general admission plus barbecue plate. The admission ticket pays for soft drinks, beer, cotton candy, rides, popcorn, bingo, dunk tank and other attractions.

Music will be provided by a group called Steamboat Willie. Bus service is available from the parking area to the picnic grounds from 11 a.m.-5 p.m. Get tickets from an EAA representative or at the Bldg. 11 Exchange Store.

REMINDERS

Today, April 1, is the last day to sign up for cardiopulmonary resuscitation classes at the Recreation Center or to register teams for upcoming softball league competition. Call the center at X-4921 for information.

YOGA & DANCE

Registration is being held now through April 11 for two different yoga classes at the Recreation Center.

Yoga with general exercise and dance costs \$17.50 for four hours, Tuesday, 4:45-5:45 beginning April 19. True yoga classes are \$30 for six hours, 6-7:30 p.m. beginning April 19.

Enrollment for JSC Ballroom Dance classes will be held April 6 at 6:45 p.m. and 8:15 p.m. at the center. Cost is \$37/couple for 10 wks. Classes will be held every Wednesday under instruction of Rae & Bob Calvert. For information, call Billie Fairfax, X-3050.

COMPUTER CLUB

The JSC Computer Hobbyist Club has changed its meeting schedule to the first Thursday and third Monday of each month from 5-7:15 p.m. in Room 209 of the Gilruth Center.

Club meetings are open to all NASA and contractor employees. For more information, contact Dale Fessenden, X-2800.

TENNIS TOURNEY

Ninety couples competed in the mixed doubles tournament held March 12-13 by the JSC Tennis Club.

In the novice division, David O'Brien and Linda O'Brien defeated Norman Beck and Ginny Beck, 6-2, 7-6.

In the intermediate division, Buddy Yolland and Sandy Yolland defeated Jerry Craig and Nancy Hughes, 7-5, 6-2.

In the advanced division, Dorsey Wilmarth and Rocky Mills defeated Ken Westerfield and Lisa Griffith, 2-6, 6-4, 6-2.

Ames women help set Shuttle rider standards

AMES RESEARCH CENTER, Calif. - Ten women volunteers will be selected early this month as medical test subjects to help set medical standards for passengers who may ride aboard Space Shuttle in the 1980s.

The women in the study will be age 35 - 45 and with non-technical backgrounds. They will be joining 24 volunteers accepted last month who started preliminary testing at Ames on March 28. The final group of ten will begin the experiment on April 14 and end May 10.

Test procedures, similar to other studies at Ames in the past, call for total bedrest over a nine day period to simulate weightlessness and brief spins on a centrifuge to simulate Shuttle entry back into Earth's atmosphere.

The main objective is to determine for this age group and sex how weightlessness might affect the body in general and its ability to react to reentry.

Two of the ten women, during the nine day bedrest, will also take some commonly used medicines to see how weightlessness and reentry might affect the body's disposition of these compounds.

Bedrest studies at Ames have included groups of men and younger women. The most recent was with a group of men, age 35 - 45, completed last year.

The series is intended to find out, from a medical point of view, how age, sex and physical condition might affect selection of Space Shuttle passengers.

Roundup Swap Shop

Swap Shop advertising is open to JSC federal and on-site contractor employees. Goods or services must be offered as advertised, without regard to race, religion, sex or national origin. Non-commercial personal ads should be 20 words or less, and include home telephone number. Typed or scribbled ad copy must be received by AP3/Roundup by Thursday of the week prior to publication.

CARS & TRUCKS

- 76 Cadillac Coupe. Fully equipd, 9,500 mi, lt blue w/matching top & interior. \$8,750. 333-2616 or 333-3672.
- 76 Cutlass Supreme Brougham. 14K mi, loaded, AM/FM/CB radio. \$5,250. 332-2080 after 5:30.
- 73 Toyota Corolla. 4 dr, 4 spd, air, xint cond. \$1,325. Wilson, X-3803 or 488-7169 after 5.
- 71 Grand Prix SJ. Fully loaded, good cond. \$1,725 or make offer. Charlton, X-2267 or 333-3105.
- 65 Olds Cutlass. 4 dr, good cond, auto, radio, recent brake job, alternator, tires, shocks. \$300. X-3409 or 488-3700.
- 75 Dodge Maxi-Van. Compl customized for camping. \$4,995. 534-4070 after 5:30 or weekends.
- 69 GMC 3/4 ton pickup. Auto, air, heater, radio, tape, new all alum shell. \$1,395 or best offer. Will sell separate. 479-4261.
- 71 GMC 1/2 ton pickup. 350 V8, std air & radio. \$1,600 or best offer. 771-4246.

CYCLES

- 75 Kawasaki 900. Low miles, wndshld, crash bar, runs perf. \$1,300. 991-2815.
- 71 Honda CL 175. Low miles, adult rider. \$225. Smith, X-4468.
- 74 Norton 850 Commando. 2,500 mi. Best offer. 334-2317 after 5.
- 75 Honda 550CB. 10K mi, Windjammer II fairing, Fletcher Custom (dubl bukt) seat, match sissy bar pad & covers, Harley 16" wheel, 10" handle bars, air horns, needs tune. \$1,270 or trade. 482-3100 after 5.
- 72 Honda SL-125. Good cond, 4,500 mi. \$300. Elmore, X-3705 or 645-7649.
- 75 Honda CB360T. New cond. \$626. Kosel, X-6421 or 534-6098.

BOATS & PLANES

- Sailboat, Finn No. 297, Newport Builder. 2 masts, booms & sails. From valuable mold, winner numerous local, dist races. Galvanized built for Finn trailer. Negotiable. Goodman, 333-2778.
- Sailboat, Dolphin Senior. Like new, always garaged, new trailer, all perfect. \$650. Harvey, 621-5311.
- Sailboat, Sunfish-type, wood. \$100. 474-2906 after 6.
- Sailboat, 16' Hobie Cat w/Little Dude trailer. Xint cond. \$1,850. 481-8284 after 6.
- Bass boat, U16 Quachita. 85 HP Mercury, 2 gas tanks, troll motor, live well, depth find, trailer. \$2,700. Guest, 427-8731.
- 72 Grumman Traveler. 1040 TTSN, NAV 11, COM 11, AT50 xpondr, King KX 145B NAVCOM, ADF, 3 lite marker beacon. \$13,000. 943-1945 evngs.
- Aircraft equipmt. King KX 160, 100 NAV/360 COM w/power supply but no NAV head. Cert all channels in Feb. \$500 firm. Pruett, X-4491 or 487-4914 after 5.

PROPERTY & RENTALS

- Beautiful 2 acre partial wooded residential lot, El Lago. Cash or terms. 334-3370.
- For rent: Lake Livingston, Cape Royale, compl furn home, 3-2-1. Fishing, hunting, tennis, golf, etc. Reserve early. Wk/mo/yr rates. 488-4487.
- Galveston West End. 2 bdrm By-the-Sea condo apt, full furn. \$180/wk off season, \$260/wk in season. Clements, 474-2622.
- For rent: 3 bdrm, 2 bath house in Wedgewood, Friendswood. Dining rm, fireplace, covered patio, 6 mi to NASA. Avail Apr 15. 482-5393 after 5.
- Patio lot at 7 Coves on Lake Conroe. Investment buy, low equity. Parker, X-4241 or 481-4372 after 5:30.

STEREOS & CAMERAS

- Fisher stereo. Pre-am/amp, tuner, turntable, speakers, records. \$150. Hutchinson, 488-0971.
- Sony TC-127 stereo cassette player/recorder, xint cond, \$85. Cassette tapes, varied selection or blank, \$1.50-\$3. Marsha, X-3774 or 488-6266.
- Midland 8 track player w/2 speakers. Very good cond. \$35. 333-2964.
- Health HW 101 Transceiver. CW filter, AC power supply, delux speaker, mint cond, guarantee. Lindsey, X-2901 or 488-0517.
- Konica Auto Hexanon lenses. 35mm, f2.8, \$75. 135mm, f3.2, \$50. Both like new. Pruett, X-4491 or 487-4914 after 5.

HOUSEHOLD ARTICLES

- Portable window air conditioner, 5500 BTU. Used only 4 mos, Mont Ward. \$175. Steve, X-5841 or 332-6620 after 5:30.
- Green sofa, 102" long. Combination cedar chest w/drawer. 333-2616 or 333-3672.
- 3 pcs sectional bdrm furn, incl desk & 2 bachelor chests, pecan w/formica tops, \$145. Orange corduroy accent chair, \$45. 485-3821.
- Mahog Early Amer hi-boy. Xint cond. Goodman, 333-2778.
- Singer Futura II sew mach. Lg Mediterranean cabinet, used 3 mos. \$650. Baytown, 427-6265.
- Sears upright Coldspot freezer. 17 cu ft, frost free, white, perf cond. \$150. 334-3370.
- Dining rm table, Danish mod. DK hardwood w/center leaf & 4 chairs. Xint cond. 935-5220 (Tx Cty) after 5:30.

MISCELLANEOUS

- Evette Schaeffer B Flat Clarinet. 5 RV mouthpiece, all wood, xint cond, used 2 yrs. \$250. Cost over \$500. 488-0549.

- Garage sale. Camino South, 739 Sea-foam. 9-6 Friday, Apr 1, 9-1 Saturday, Apr 2.
- Nimrod Tent Trailer. Sleeps 4. \$400. 482-7775 after 5.
- 74 Brougham Motor Home. 24 ft, sleeps 8, 3 AC, 5 KW, full equipd. \$10,250. 333-2182 or 333-3738.
- Mower, Toro "21" Rotary. \$75. Hutchinson, 488-0971.
- Lawnmower: 19" Toro Whirlwind. Good running cond. \$40. Welch, 474-2654.
- Tire & wheel (F78-14) mounted, almost new. \$15. Jim, X-4339 or 481-3648.
- Touch tone pads. Crystal control w/Motorola CMOS chip. Adequate audio output to drive transmitter, RF proof assembled. \$25. Schnell, X-2271 or 473-2602.

WANTED

- 1967 graduates of South Houston High or parents thereof. 10-yr reunion planned. Please contact ASAP, S. Schmidt, X-4063 or 333-4379.
- Want Sunfish sailboat w/old style rudder, good to xint cond please. Jones, 471-3303.
- Back issues or all model airplane magazines. Trying to build a set of reference materials for modelers of all ages. Warren, X-4471 or 331-3225.
- Wanted: Pet snake. 474-2081.
- Need garden spot roto-tilled, 20X80 in Dickinson. Who did this for me before? Lost your name. Foster, X-4087.
- Need riders for carpool from W Loop, SW Fwy, Bellaire area. 8-4:30. McLaughlan, X-3771 or 661-2974.
- Firefighters needed. Adult men & women residents of Clear Lake City for CLC Volunteer Fire Dept. You will be trained & equipped. 488-0023 anytime.

LOST & FOUND

- Lost red change purse near Bldg 4. Reward. Delores X-2691.
- Lady's ring found in parking lot across from Bldgs 17 & 45. Identify. Ginny, X-3611.

LATE ENTRIES

- Wooded waterview lot for sale. Pt Lookout on Lake Livingston, 75X137, utils, restrictions, private campground. \$3,500. 946-7587.
- 6 yr old registered 1/2 Arabian mare. Chestnut w/white star, 15 hands, trained for halter & western pleasure. \$750. Tack \$125. 482-7140.
- 69 Olds Cutlass S. Clean, low miles, good work car. \$750. Wardell, 649-3914 or 333-3587 after 6.
- Sofa, black tufted naugahyde w/blt-in wood end tables. 9' total length. \$60. Glines, X-3511 or 861-5278 after 6.
- 2 adjacent lots near water, Lake Livingston, Shelter Cove. Lovely wooded, utilities. Low equity, low paymts. Patnesky, X-5111 or 353-4313.

1	2	3	4	5	6	7	8
9	N			10			
11	O			12			
			13				
14	15	16			17	18	19
20				21			
22				23			

JSC crossword

DOWN

(See answers, page 4)

ACROSS

- Large lump
- Bond
- Against
- Gumbo ingredient
- Apollo souvenirs
- Neither solid nor liquid
- Orbiter landing description (2 wds)
- "Othello" villain
- Canal
- High school dance
- James or Dizzy

- Mercury chimp
- ____, dos, tres
- Nitrogen Tetroxide ("astronym")
- Monarch's realm
- Launched to higher altitude
- American Kennel Club (initials)
- Annoy
- ____ Cruces, NM
- Ethiopian prince
- Submerge
- Organ of hearing
- Gone by
- Provoke to anger
- Spy bureau
- Astronaut ____ Mattingly

Controllers turn off Viking spectrometer

The instrument aboard the first Viking lander that searched Martian soil samples for organic compounds has developed a malfunction in its power supply and has been turned off.

Controllers at NASA's Jet Propulsion Laboratory, Pasadena, Calif., sent commands to the spacecraft March 12 ordering it to shut down the gas chromatograph mass spectrometer (GCMS). Confirmation was received March 14.

Viking Project Manager G. Calvin Broome explained that an electrical short circuit in an instrument power supply made data generated by the GCMS unusable. The supply provides power to a pump that keeps the instrument free of gases that have been analyzed.

The project manager, working with mission operations personnel and the GCMS science team, decided to turn off the GCMS because high voltages generated by the faulty power supply might en-

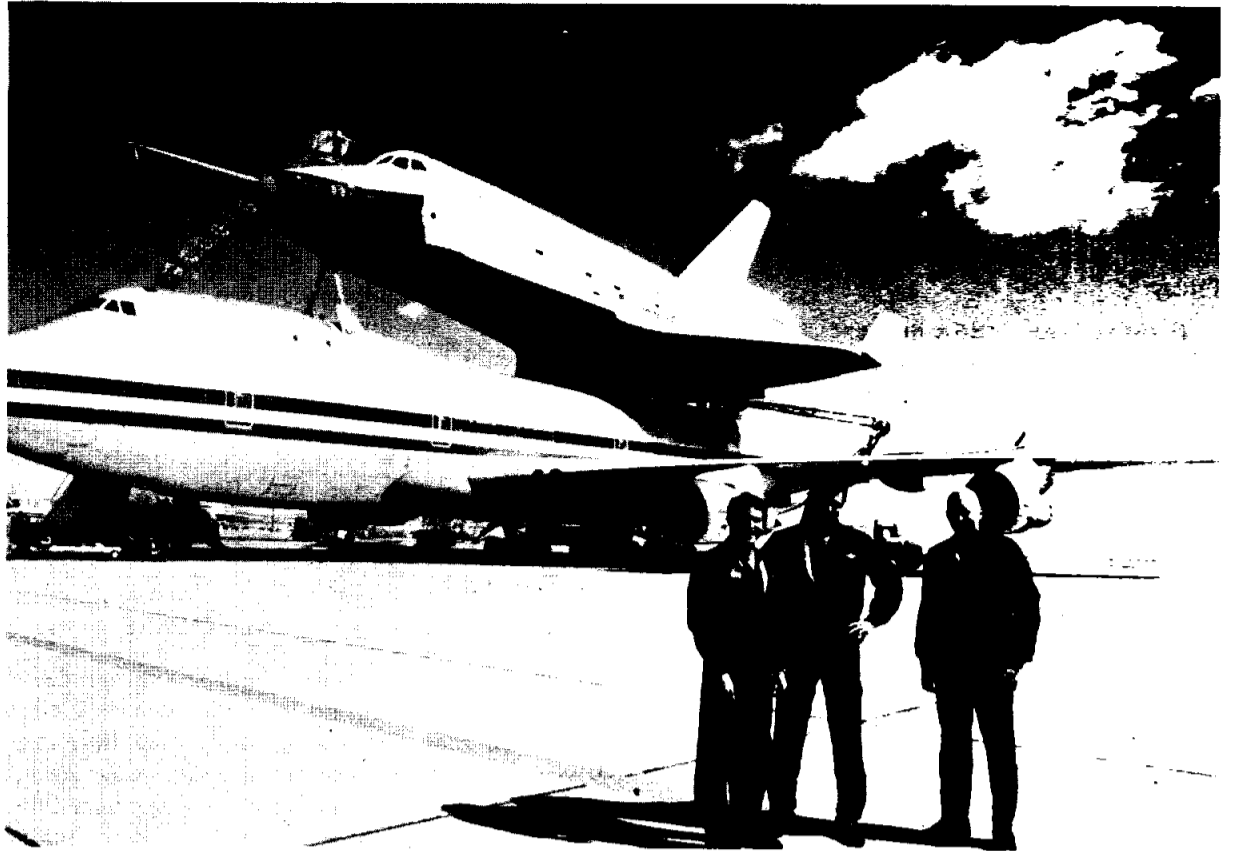
danger other instruments aboard Lander 1 or its onboard computer and communications system.

The instrument had completed its tests on Martian soil samples some time ago. It established the absence of organic compounds in the surface layer at its location on Mars, thus making fundamental contributions to scientists' understanding of the chemistry of Mars and contributing to interpretation of results from the biology experiments.

The GCMS also determined the composition of the atmosphere at the surface of the planet and discovered the primordial argon isotopes, which will help unravel the planet's history.

A second gas chromatograph mass spectrometer, aboard Viking Lander 2, continues to function.

Project Viking is managed for NASA by Langley Research Center, Hampton, Va. The mission is controlled at JPL.



ENTERPRISE CREW — Three of the four members of the two Orbiter crews for the Space Shuttle Approach and Landing Tests are shown here in front of the mated 747/Orbiter at Dryden Flight Research Center, Edwards

AFB, Calif. Left to right are: Richard H. Truly, pilot of the second crew; Joe H. Engle, commander of the second crew, and C. Gordon Fullerton, pilot of the first crew. Not pictured is Fred W. Haise Jr., commander of the first crew.

Six firms given JPL contracts to design solar-power sailcraft

Six firms have been awarded contracts by NASA's Jet Propulsion Laboratory, Pasadena, Calif., for the design of a sailcraft that would be propelled through space by energy of the Sun. The awards total \$800,000.

The Solar "Sail" would employ a mirror-like aluminized plastic surface to attract the radiating photons which carry momentum. When reflected, the photons change momentum and a force is exerted against the reflective surface — much like a wind against a sail.

NASA has embarked on the project to prove the feasibility of the concept for long-term, low-thrust space missions in the 1980s, including a possible Halley's Comet rendezvous in 1986.

Contracts have been awarded to E. I. Dupont Co., Wilmington, Del., \$250,000 for fabrication of one candidate sail material; MacNeal-

Schwendler, Los Angeles, \$350,000 for helio-gyro design; International Latex Corp., Dover, Del., \$50,000, and Sheldahl Corp., Northfield, Minn., \$50,000, for design of the sail material; Able Engineering, Goleta, Calif., \$50,000, and Astromech Corp., Carpinteria, Calif., \$50,000, for design of booms.

The Solar Sailing Development Program will attempt to bring to realization an idea that has intrigued the imaginations of space scientists and engineers for five decades: Why not use the Sun's photon energy to propel a large reflective sail on a free ride through space?

Speed of the Solar Sailcraft depends on distance from the Sun and the size, weight and angle of the sail; the greater the sail surface and proximity to the Sun, the greater the reflectivity pressure or energy thrust.

By tracking against (or with) the solar photon stream, the Solar Sailcraft could fly inward toward the Sun or outward.

NASA would, if the plan succeeds, demonstrate the Solar Sail with a 1981-82 launch from the Space Shuttle toward the Sun and a trajectory-reversal outward to intercept Halley's Comet in March 1986.

For the definitive first flight, the furling sail would be taken into orbit by the Shuttle and boosted into solar orbit, unfurling automatically.

The NASA task force is thinking big. The Solar Sail development program headed by Howard H. Haglund includes design of an 800-meter (2,400-foot)-square plastic film sheet and only 2.5 microns (0.1 mil) thick, plus ultra-lightweight extensible booms for the spars and masts of the Solar Sail.

Dr. Humberto Fernández-Morán to lecture on ATS-6 at UHCLC

Dr. Humberto Fernández-Morán, internationally known scientist from the University of Chicago, will deliver two free lectures at the University of Houston at Clear Lake City. One, of special interest to the public, will be at 8 p.m., Tuesday, April 12 in the auditorium of the Bayou Building, 2700 Bay Area Blvd.

Titled "Windows on Latin America," it will deal with the use of NASA's ATS-6 satellite to transmit medical information between the U.S., Venezuela and Brazil. This satellite was over India for a year during which time it beamed educational programs to remote villages. Fernández-Morán will use a film in which Dr. Wernher von Braun discusses the ATS-6.

The other lecture on electron

microscopy will be at 1:30 p.m. Monday, April 11 in Room 2-532 of the Bayou Building.

Fernández-Morán is principally known for developing two important tools for scientific research. One, the diamond knife, is the sharpest and most sophisticated cutting instrument in the world today. It is used to slice viruses and to prepare ultrathin sections of normal and cancer tissue, in delicate eye surgery, and widely in biological and biophysical research.

The professor also developed low temperature electron microscopy. The "cryo-electron microscope" he and his colleagues developed at the University of Chicago is the only one of its kind in the U.S.

The city of Philadelphia awarded Fernández-Morán the prestigious

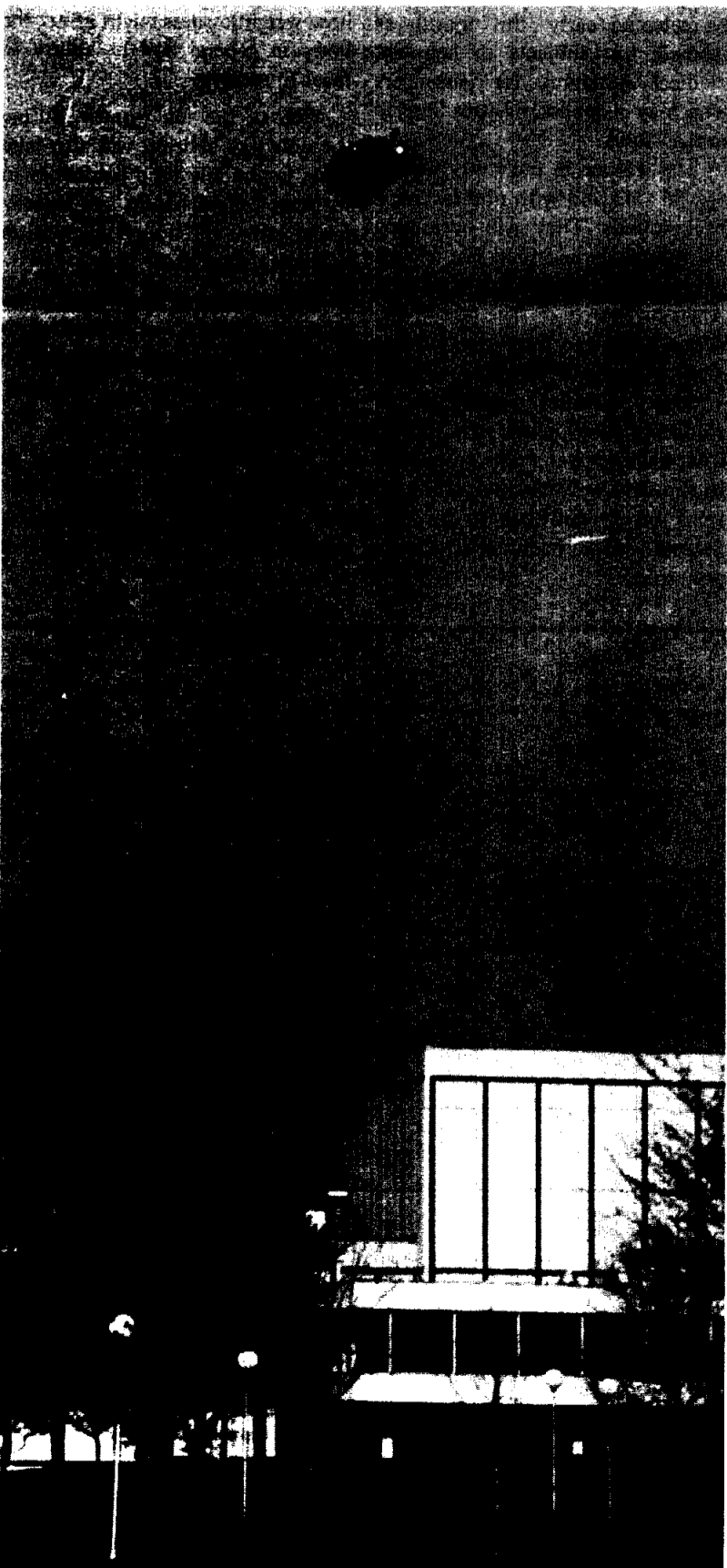
John Scott Medal previously given to Marie Curie, Jonas Salk and Sir Alexander Fleming.

A native of Venezuela, Fernández-Morán was educated in Germany. He came to the University of Chicago in 1962. Recently he was appointed A.N. Pritzker Professor of Biophysics there.

JSCrossword answers

(See puzzle, page 3)

N	A	D	E	D	W	O	R	P
E	R	I	E	O	A	G	O	I
K	C	I	S	D	A	S	T	D
		S	A	G				
S	K	O	R	O	N	O	W	
A	R	O	K	I	A	N	T	A
L	A	B	K	H	U	N	K	H



ALIEN VISITORS — We debated whether or not to call this photographic evidence of a visit to JSC by a spacecraft from the planet of Loof Lirpa (that's April Fool spelled backwards) but decided that this "UFO" is too easily identified as the famous blimp from the Company of Tires and Rubber.