

SKYLAB 2 CREW RETURNS—Scientist-Astronaut Joseph P. Kerwin, science-pilot for the Skylab 2 mission, speaks to a crowd at Ellington AFB during welcome home ceremonies for the crew. Astronaut Paul J. Weitz, pilot, is at center; and Astronaut Charles Conrad, Jr., crew commander, is at right. The wives, standing by their husbands, are (l-r) Shirley Kerwin, Suzanne Weitz and Jane Conrad. The crew arrived home June 24, 1973.

## Skylab 2 Crew Keeps Busy Schedule

The Skylab 2 astronauts have been undergoing medical experiments and technical debriefings at JSC for the past two weeks.

On the fifth day of their return to Earth, the astronauts underwent a series of medical experiments identical to those they performed during the Skylab mission. These experiments helped to inform doctors about the reaction of the crew's cardiovascular systems to the Earth's gravity. In space, these experiments tell medical scientists how the body is reacting to the absence of gravity.

"If this is the worst that space can do, we are up there to stay," Kerwin stated.

Christopher C. Kraft Jr., JSC director agreed that this mission proves "that man is in space to stay".

Until the experiments are over the crew will be required to eat Skylab-food.

Along with the medical experiments  
(Continued on Page 2)

## Lunar Landing Queen Chosen

From the "look of things" the Lunar Landing Festival will indeed be a gala occasion with its queen and her court reigning over the activities, scheduled July 20-22.

Chosen as Lunar Landing Queen was Sharon Boniface, code TA. In addition to reigning over the Lunar Landing Festival, Sharon will participate in social activities at the Center and work

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# ROUNDUP

NASA LYNDON B. JOHNSON SPACE CENTER

HOUSTON, TEXAS



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## Skylab 3 Crew To Exercise More

The Skylab 3 crew will probably exercise twice as much as the Skylab 2 crew did, Alan Bean, Skylab 3 commander said.

During a recent conference held at JSC, the SL-3 crew said exercise is more important than they previously thought. The emphasis on exercise resulted from medical findings that the first crew's recovery from their 28 days of weightlessness was directly related to the amount of exercise each man got in space.

A bicycle-like machine fastened to the floor of the wardroom is the primary exercise device aboard

the spacecraft. The SL-2 crew remarked that the bicycle did not exercise all of the muscles in the body, particularly those in the calf and chest areas. Engineers are looking for devices that will reach these areas.

The crew is even more confident of their mission because of the success of Skylab 2.

Bean remarked that he foresaw no barriers to staying 56 days in space, "... The main problem is self discipline, nothing physical or mechanical.

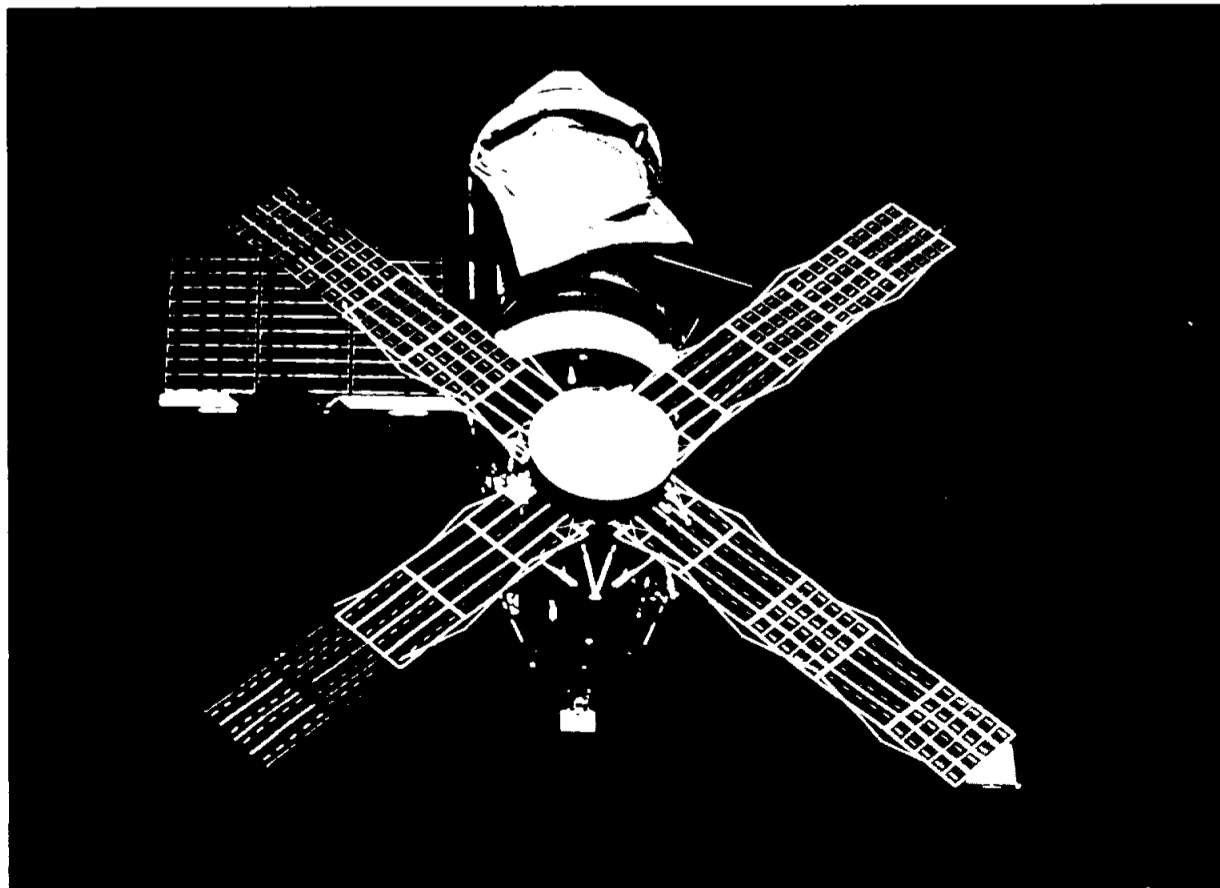
"The biggest challenge is to keep an alert attitude going on a

day-to-day basis for a long period of time."

NASA has announced July 28, 1973, as the target launch date for the Skylab 3 manned mission.

SL-3 had previously been scheduled on August 8, 1973.

Skylab Program Director, William C. Schneider stated, "The unexpected usage of the cluster hardware during the unmanned period has exposed the electronics, batteries and systems to unusual environments. It seems prudent, in the interest of recovering the maximum scientific data, to move the launch date forward."



OVERHEAD VIEW OF SKYLAB 1 SPACE STATION—An overhead view of the Skylab 1 space station cluster in Earth orbit photographed from the Skylab 2 Command/Service Module during the final "fly-around" inspection by the CSM. The space station is sharply contrasted against a black background. Note the deployed parasol solar shield which shades the OWS where the micrometeoroid shield is missing.



LUNAR LANDING QUEEN AND COURT—Lunar Landing Queen Sharon Boniface (front center) sits on the Lunar Rover with her court. Sitting beside her are Mary Yarbrough (left) and Dorothy Holloway (right). Standing, (left to right), are Marilyn Ross, Carol Brinkman, and Sharon Kemp.

## Employees Honored

During a recent conference, the American Astronautical Society (AAS) gave awards to several individuals who they felt have made outstanding contributions to the nation's space programs.

Charles W. Mathews, associate administrator for applications, NASA, received AAS' Space Flight Award. This award is given to a person "... whose outstanding efforts and achievements have contributed most significantly to the advancement of space flight and space exploration."

The Flight Achievement Award went to John W. Young, Thomas K. Mattingly and Charles M. Duke, Jr., (Apollo 16 crew). This award is presented annually for "... achievements in flight testing which have contributed significantly to the advancement of manned space

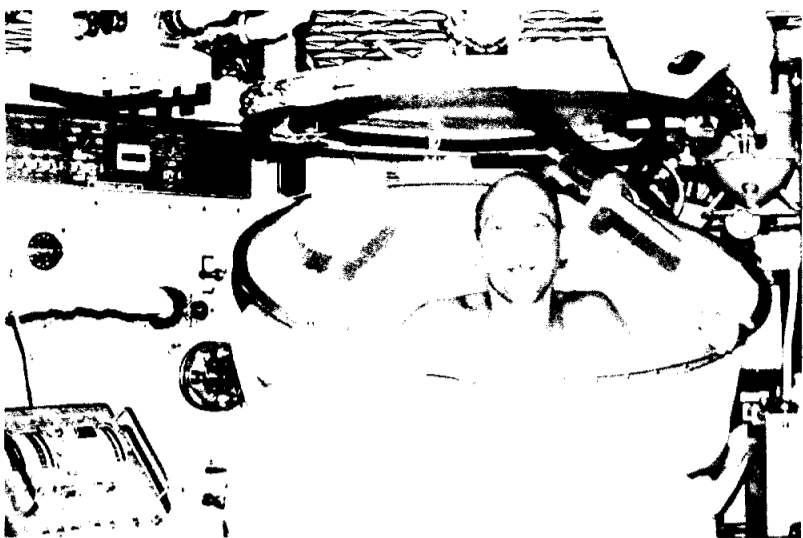
flight."

The Prather Award was presented to Harold I. Johnson, retired NASA space expert whose "... outstanding contributions in the field of extravehicular protection in space," include studies of how people can maneuver in zero gravity and the origination of the "space gun" used for extravehicular propulsion in the Gemini and Apollo projects.

Established in 1962, the Prather award honors Dr. Victor A. Prather, a Naval flight surgeon who contributed much to the understanding of the effects of high-altitude environment on humans.

Stanley Weiland, project manager for NASA's Earth Resources Technology Satellite (ERTS), received the Berkner Award "... in recognition of outstanding  
(Continued On Page 2)

# Skylab 2 Astronauts "On the Move" In Space



**BATH TIME**—Astronaut Charles Conrad, Jr., Skylab 2 commander, smiles happily for the camera after a hot bath in the shower facility in the crew quarters of the Skylab 1/2 OWS. The water comes through a push-button shower head attached to a flexible hose.



**AHH!**—Kerwin gives an oral physical examination to Conrad. They are in the crew quarters wardroom of the JWS. Conrad almost literally stands on his head in the weightlessness of space with only a restraint around his left leg holding him in position.



**SLEEP RESTRAINT**—Scientist Astronaut Joseph P. Kerwin is photographed strapped into the sleep restraint in the crew quarters of the OWS. He is wearing the special cap which contains biomedical instrumentation for the M-133 Sleep Monitoring Experiment.



**EXPERIMENT**—MO92—Kerwin serves as test subject for the Lower Body Negative Pressure (MO92) Experiment. Weitz assists Kerwin with the blood pressure cuff.

## Skylab 2 Crew—

*(Continued From Page 1)*

ments, the astronauts have had numerous debriefing sessions with scientists and engineers concerning all aspects of Skylab 2.

Kenneth Kleinknecht, head of the Skylab Program at JSC praised the mission as an "unqualified, overwhelming success."

"Our significant problems," Kleinknecht said, were the result of the initial failure.

"Once we got that under control, the systems have worked, over-all, just as expected. I believe that we are through the period when you might expect infant mortality problems with the hardware."

Conrad said the space station was left in top shape for the Skylab 3 crew.

"I'm glad to turn it over to Captain Bean and as far as I'm concerned he's go for 56 days," he said.

## Lunar Queen—

*(Continued From Page 1)*

with PAO as an amissary for JSC.

The queen's court include Mary Yarbrough, code TA; Dorothy Holloway, code MO; Marilyn Ross, code NA; Carol Brinkmann, code HA; and Sharon Kemp, code ED.

Sponsored by the city of Houston, the Festival will get underway with a Lunar Ball at the Albert Thomas Convention Center, July 20. The Ball is open to the public.

Also on the agenda is a ribbon-cutting ceremony to open NASA's Space Show and Artifacts Exhibit. The ceremony will take place at noon July 21; afterwards, a social tea will be held at the River Oaks Country Club.

On July 22, a private ball will be given at the Astroworld Grand Ball Room.

## Employees—

*(Continued From Page 1)*

contributions to the commercial utilization of space technology." The award was established in 1967 to honor the late Dr. Lloyd V. Berkner, distinguished scientist and research administrator and founder of the Southwest Research Institute in Dallas.

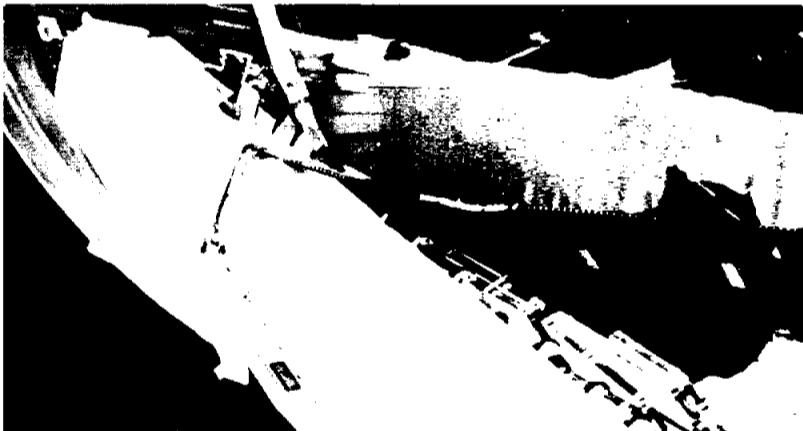
These awards, among others, are presented annually at the AAS Space Awards Conference.



**BARBERSHOP IN SPACE?**—Conrad trims the hair of Weitz during the 28-day Skylab 2 mission. They are in the crew quarters wardroom of the OWS of the Skylab 1/2 space station.



**CHECKUP TIME**—Weitz gets a physical examination by a fellow crewman, Joseph P. Kerwin, Skylab 2 science pilot and a doctor of medicine, Kerwin uses a stethoscope to check the heartbeat of Weitz.



**DAMAGED SOLAR ARRAY**—A close-up view of the damaged and partially deployed OWS solar array system wing showing the aluminum strapping which prevented the solar panel from deploying properly.



**JUNE 7 EVA**—Astronauts Conrad and Kerwin take part in the June 7th Skylab EVA to repair the damaged and partially deployed solar array system wing on the OWS of the Skylab 1/2 space station in Earth orbit.

**ROUNDUP**

NASA LYNDON B JOHNSON SPACE CENTER      HOUSTON TEXAS

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**Take stock in America.**

## JSC Selects Pratt And Whitney

JSC recently announced that it has selected a Pratt & Whitney Aircraft Division engine for use in atmosphere flight on board the Space Shuttle orbiter.

The engines will be secured for NASA by the United States Air Force; a partner with the space agency in orbiter development. They will be off-the shelf items that currently are in use by the USAF.

The Air Breathing Engines will be used during horizontal flight testing of the orbiter, and for ferry flight once the Space Shuttle is operational.

NASA plans to secure 25 engines of a model identified as TF33-P-7, an engine that is in service on the Air Force C-141 Starlifter transport aircraft. The engine has a sea level static take-off thrust of 21,000 pounds.

Modified engines of the same type also are used by commercial airlines.

This is the fourth major systems selection for NASA's Space Shuttle. A contract for design, development, and production of the orbiter vehicle and for integration of all elements of the Space Shuttle system was awarded to Rockwell International's Space Division, Downey, California, last July.

Earlier Rockwell International's Rocketdyne Division, Canoga Park, California, was awarded the contract to develop and produce the orbiter's main engines.

Presently, four companies have bid on the contract to design, develop and produce the Shuttle's External Tank. Selection is expected in August.

## CL Graduate Center Fall Schedule

Listed below are the classes which will be offered at the University of Houston Clear Lake Graduate Center for the fall semester.

- Biology 664A - Advanced Population Biology
- Mathematics 439T - Selected Topics in Math
- Mathematics 477A - Advanced Linear Algebra
- Physics 430T - Selected Topics in Astrophysics
- Russian 135 - Introductory Russian for Science Majors
- BMS 632 - Human Behavior in Organizations
- PLM 631 - Production and Logistics Management
- QMS 131 - Fundamental Mathematics for Business Applications I (For Graduate Students only)
- QMS 132 - Fundamental Mathematics for Business Applications II (For Graduate Students only)

Classes in English and Education will also be offered. Contact the Clear Lake Graduate Center at 488-6680 for course details.

Employees planning to enroll in fall semester classes at the University of Houston should be aware of the following dates:

July 10 - Deadline for filing an application for admission with the Graduate College. New students will not be permitted to register without filing an application.

August 23-24 - Registration

August 30-31 - Pay tuition and fees

September 4 - Classes begin

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September 5 - Late registration (JSC will not pay the late registration fee of \$5.00)

September 7 - Pay tuition and fees if you registered late.

Employees seeking Government sponsorship of job-related training are reminded that Form 75 must be completed and forwarded to the Employee Development Office, Code AH3, prior to the date that tuition and fees become due. Questions concerning Government sponsorship should be directed to the Employee Development Office.

## Roundup Swap-Shop

Swap Shop advertising is available to JSC and on-site contractor personnel. Articles or services must be offered as advertised, without regard to race, religion, sex or national origin. Ads should be 20 words or less, including home telephone number. Name and office code must accompany, but need not be included in ad copy. Typed or printed copy must be received (AP3 Attn: Roundup) by Thursday of the week before publication.

### MISCELLANEOUS

Dynaco Quadaptor, QD 1 assembled, new list, \$30, sell \$15, Ragan, 2891 aft 5, 481-0408.

Nikon Photonic FTN w/Nikkor auto 50 mm f/1.4, new, \$375, Nimr, 771-0815.

Scott 65 watt am/fm stereo receiver, Garrard turntable, 3 speakers, Doherty.

Monkey grass, 50c/bunch, Argus model 812 super 8 movie camera w/ zoom lens and Sylvania sungun movie light \$20, 488-3409.

Ice skates, new boys hockey, sz 5, \$10, wheelbarrow, li new, \$5, 488-4005.

8'6" Bing surfboard, \$40, Lanier, 337-2165.

### HOUSEHOLD ARTICLES

Bdrm suit, mattress, bx springs, hdbd, dresser w/ mirror, night stand, Mediterranean style, li new, \$180, 337-2153.

Sears refrigerator, \$20, washing machine, \$25, Doherty, 488-0182.

Sears gas stove/oven \$55, oval braided rugs, green/yellow, 9X12, \$20, blue 8X10, \$10, Lanier, 337-2165.

Carpet, tan, 4 1/2 X 7, \$10, 2 sets of matching foam mattresses and box springs, twin sz, \$80, set twin innerspring mattresses and box springs, \$30, 488-4005.

Ethan Allen dining table, Solid maple, round w/ 2-12" leaves, 4 captain's chairs \$250. Gd cndn, 481-2833.

### VEHICLES

71 Ford Sta Wan, DFRS, xlnt cndn, lw mi, auto, pwr, air, lug rack, Metz, 534-4771.

67 Cutlass Supreme, 4-dr, pwr, air, gd cndn, white w/ blc vinyl, \$830, Black 482-1635.

70 Volkswagen, xlnt cndn, radio, air cndn, 27,000 mi, \$1450, Davidson, 333-2488.

65 Oldsmobile 442 conv, auto, pwr, air, \$400, Cordenas, 333-2946.

71 Pinto Runabout, 28Kmi, xlnt mech cndn, standard shift, radio, \$1300, 472-5243 aft 5 pm wkdays, all day Sat, Sun.

72 Caddy Sedan De Ville, all extras, leather sacrifice wholesale, \$5250, Cobb, 333-4109.

71 VW 411, 4-dr, auto, air, \$2200, 941-8617.

Airplane for rent, Cessna 150, \$11/hr, instructor, \$6/hr, based League City, S & S Patrol Field, Laurentz, 488-2537 or 322-1822.

63 Ford Falcon "G" stan trans, gd gas mi, \$150, O. L. Pearson, 334-1243.

71 Ford F100 Ranaer Styleside w/ delux covr, auto trans, pwr brk, air Western style mirrors, clean, 28,000 mi, 471-0654.

70 Yamaha 350 motorcycle street bike, gd cndn, 482-7896 aft 6 p.m.

71 Ford Truck, 6 cyl, 1/2 ton LWB, only 13,000 mi, xlnt cndn, w/ camper shell, Roberts, 479-3929.

8 ft Cabover camper, air, sleeps 5, reasonable price, McCreary, 946-5285.

Ferrari 330 GT, 4 liter V-12, 5 spd, xlnt cndn w/ natural leather interior, Hirasaki, 332-4247.

61 VW, gd cndn, no rust, nw tires, brakes, shocks, \$350, Huber, 334-3245.

Travois cabover camper, 11 ft, self contained, loading jacks, auxillary wheels, etc, gd cndn, would consider selling pickup w/ camper, 333-3813.

20' boys Schwinn sting-ray bike, \$25 488-4005.

New 73 Honda 500 4-cycle fully equipped incl 2 new helmets, 190 mi, \$1395, 781-2190 (days), 721-1432 (evenings).

Shasta 16 ft self-contained vacation trailer, xlnt cndn, stabilizing hitch & brk cntrl incl, Gabbard, 474-2349.

### PROPERTY & RENTALS

3-2-2 brick Colonial fncd yd, central air,

pool privileges available, Fairmount West, available August 1st, Muhly 471-3762.

3-2-2 Clear Lake City (Oakbrook) small cul de sac home w/ lrg fncd yd, shag carpet, drapes incl, \$24,900, 488-5605.

Sageomont Park, Spanish, 3-2-2, big lot, beautiful landscaped, lyr close to school, shopping center, many extras, 481-2477 aft 5, Lee.

Nassau Bay, 4-2 1/2-2 Spanish 2450 sq ft, front court yd, screened back patio, lrg kitchen area, wooded, \$49,500, 488-3353 days, 333-2880 eves, weekends.

Land for sale, 3.64 acres, \$2,000 per acre, 1 mi off Gulf frwy on Palmer Hwy (FM 1764) 339-1237.

House adjacent to Seabrook Intermediate school (rent) 4-2-2 carpeted, fncd, xtremely clean, 334-1263.

Lease 3-2-2 in CLC, cul-de-sac, landscaped, fncd w/ refrigerator, washer/dryer available, 488-3409.

Alvin area for sale, 4-2-2 contemp, near schools, shopping, trees, paneled den, bookcase, intercom, cntrl air, heat, 331-4205.

### PETS

Collies for sale, AKC reg litter, show quality parents, 488-4109.

AKC, blonde Cocker puppy, female, shots, 481-4664.

Weimaraner female, 12 wks, beautiful, 4 generation ancestry, \$65, 333-2162, Fritz.

Beautiful Bassethound pups, no papers, 6 weeks old, wormed, shots, Redman, 481-1703.

Free kittens, both Calico, owner leaving town, Lousma, 482-2360.

### BOATS

Jib sail, 100 sq ft., new cndn, 21 1/2 X 9 X 22, \$75, Mounce, 479-7171.

## Officers Elected

The American Federation of Government Employees recently elected officers for 1973-74. The officers include Curt Vetter, president; Aneta Davis, first vice-president; Ann McClung, second vice-president; Eston Meade, third vice-president; Nancy Whitecotten, secretary / treasurer; Verby Balinas, recording secretary; Ledrieu Linson, chief steward; and Sylvester Barrett, sargeant-at-arms.



PICNIC COMMITTEE—Pictured above are some of the JSC All Star Picnic committee members. These committee members, along with others not shown, are enthusiastically planning the JSC All Star Picnic which will be held in September.



NASA-ASEE—Forty-eight members of the NASA-ASEE (American Society for Engineering Education) summer Faculty Fellowship Program began a 10-week stay at JSC on June 4. They represent 39 universities and colleges in 24 states. The program is managed jointly by JSC's University Programs Office and the University of Houston. The participants are engaged in various research projects and in engineering systems design.

# Pioneer 11 Follows Pioneer 10 on Journey

Pioneer 11 now is more than two months out on its 20-month flight to the giant planet Jupiter and everything is working well.

The spacecraft, traveling fast enough to cross the U.S. in about two minutes, 74,000 miles per hour, has covered about one fifth of its 620-million mile flight path to Jupiter.

On its course tangent to Earth's orbit, Pioneer 11 has moved almost 30 million miles away from Earth since its launch on April 5, from Kennedy Space Center.

Meanwhile, its twin, Pioneer 10, launched in March last year and due to arrive at Jupiter next December, has covered 80 per cent of its flight path to the giant and brightly colored planet.

Pioneer 10 is almost 350 million miles from Earth. Jupiter is still out ahead of Pioneer 10 about 100 million miles, and from the spacecraft viewpoint has become the brightest object in the sky except the Sun.

Pioneer 10 continues to return good data from all scientific instruments. It is defining for the first time the interplanetary medium far beyond the orbit of Mars and well past the rocky Asteroid Belt.

Round trip for radio signals to travel from Earth to Pioneer 11 and back to Earth at the speed of light has stretched out to four and a half minutes. For Pioneer 10, light time for round trip radio communications is now an hour and 4 minutes.

Controllers from NASA's Ames Research Center, Mountain View California near San Francisco, have turned on all of Pioneer 11's 12 on-board instruments.

Two instruments, the infrared radiometer and the highfield magnetometer, will not be needed until Jupiter encounter. Flight directors have recently exercised these instruments, however.

Currently, Pioneer 11's solar wind and interplanetary magnetic

field instruments are sampling continuously the Sun's field of wind. Four high energy particle experiments are making continuous measurements of solar and galactic-cosmic ray particles.

The ultra-violet instrument is

measuring hydrogen and helium from interstellar space beyond the solar system, and the meteoroid counters are determining concentrations of these cosmic particles.

In the two months following the initial Pioneer 11 launch

events, Ames controllers have directed a second course correction, assuring that any one of Pioneer 11's several encounter options at Jupiter can be achieved.

These options include: either

close or distant equatorial passes at Jupiter; passage out of the solar system; flight over Jupiter's south pole which would give an opportunity to look down into what may be a transparent atmosphere at the poles; flight past Jupiter toward Saturn. Which Pioneer 11 options will be chosen depends upon findings of Pioneer 10 next December about conditions at Jupiter.

Along with the mid-course correction, controllers also changed the pointing direction toward Earth of Pioneer 11's spin axis (and, therefore, of its fixed 9-foot dish antenna from about 22 degrees to within 10 degrees of the Earth.

This allowed a four-fold increase in data-return rate. The dish antenna must always be pointed in the general direction of the Sun to shade the payload from intense solar radiation.

As Pioneer 11 moves farther outward, the Sun and Earth tend to line up. By May 18 these position changes allowed the antenna to be pointed directly at the Earth. At this time, flight directors also shifted from the wide-beam, medium-power antenna system, again increasing the data return rate of 2048 data bits per second. The high-power, narrow beam antenna will now be used for the rest of the mission.

On its way out from the Earth, Pioneer 11's Imaging Photo Polarimeter has been making sky maps of the zodiacal light to determine total amounts and distribution of this dust.

These observations by experimenters from Dudley Observatory, Albany, New York, are being compared with simultaneous observations from Dudley stations at Mt. Haleakala, Maui, Hawaii.

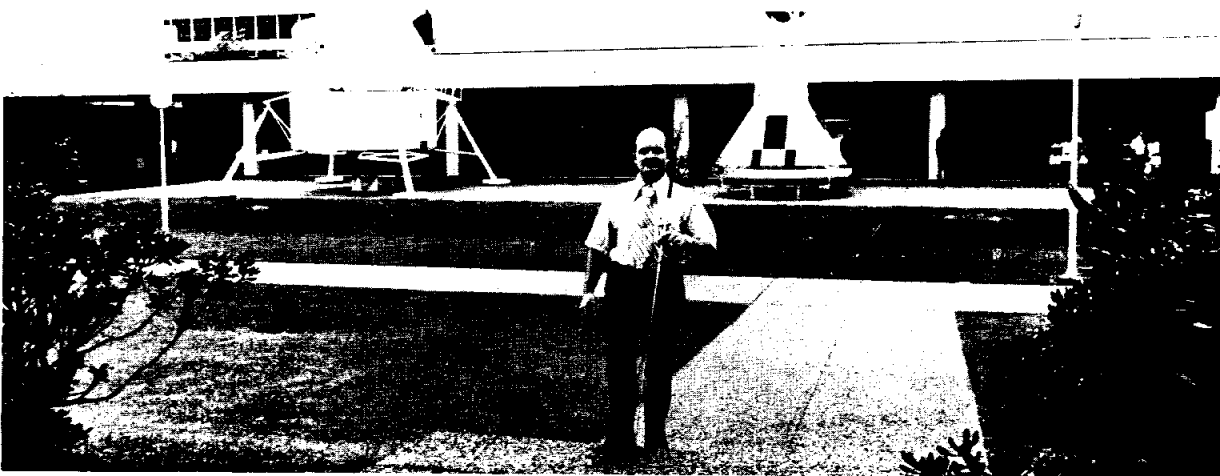
The Pioneer 11 meteoroid detector has been designed to sense larger particles than a similar instrument on Pioneer 10. Hence total numbers of meteoroid penetrations of its gas cells are lower than Pioneer 10 experienced.

A storm on the Sun the weekend of April 28, was observed by the Pioneer 11 magnetometer, solar wind, and high energy particle sensing experiments.

On Pioneer 10, during the same two-month period a pointing maneuver has been made. The Earth's orbital position is now such that controllers have been able to fix Pioneer 10's pointing direction at Earth for two months.



**EFFICIENT WORKER**—Even though Paul Richardson is partially blind he efficiently performs his job as a mathematician in Thermal Technology. In the above photo, Richardson solves a math problem. He is wearing an optical device to aid his eyesight. Below, Paul walks in front of Building 1.



## Wackenhut Selected For Negotiation

Wackenhut Services, Inc., Coral Gables, Florida, has been selected for negotiation and award of a cost-plus-fixed-fee type contract for protective services at JSC.

Protective services include security services, operation of the fire department, safety/fire engineering, and emergency ambulance services.

Wackenhut's proposed cost and fee for providing those services for the period July 1, 1973 through June 30, 1974, is approx-

imately \$1,540,000. Together with previous funds expended for these services, the total dollars set aside are \$5,836,500.

The plan calls for a three-year contract with provisions for additional negotiated one-year extensions. Over 100 Houston-area personnel are to be employed under terms of the award.

Wackenhut was the successful bidder from among six companies who bid competitively for the award.

## JSC Employees To Be Honored At Astrodome

The Astrodome will honor JSC employees with a special "Space Day" on July 31, 1973 when the Astros meet the Dodgers.

All JSC seats will be located behind home plate, and along first and third base lines.

Tickets which will go on sale July 11 are \$4; however, JSC employees will receive two tickets for \$4.

To purchase tickets contact Mary Yarbrough at extension 6455.

## Moonwalk Softball To Be Played

Sixteen teams will compete for trophies in the Moonwalk Slow Pitch Softball Tournament co-sponsored by the Space Center Memorial Hospital and the EAA in conjunction with the Lunar Festival.

The tournament will be held onsite at the NASA fields the weekend of July 21-22, beginning Saturday at 8:00 a.m. and continuing until 9:00 p.m. The remaining teams will play from 10:00 a.m.-5:00 p.m. Sunday, July 22.

## Six Flags Tickets Available

JSC employees may purchase discount tickets to Six Flags Over Texas through the exchange stores in Buildings 3 and 11.

Located between Dallas and Fort Worth, Six Flags is open daily, from 10 a.m. — 10 p.m. through September 3. After that date, it will be open on weekends only, through December 3.

Tickets are \$4.95 for adults (reg. \$5.95) and \$4.10 for children (reg. \$4.90). Each ticket is good for nearly a hundred rides, shows and attractions. Also this year, Six Flags has opened a new section—"Good Time Square"—with new rides and attractions.



**RECEIVED DEGREE**—Pictured above is Robert E. Driver, chief of the Financial Management Division at JSC. Driver recently completed the requirements for a Doctor of Philosophy in Business Administration from the University of Texas at Austin.

## Join the Payroll Savings Plan.

