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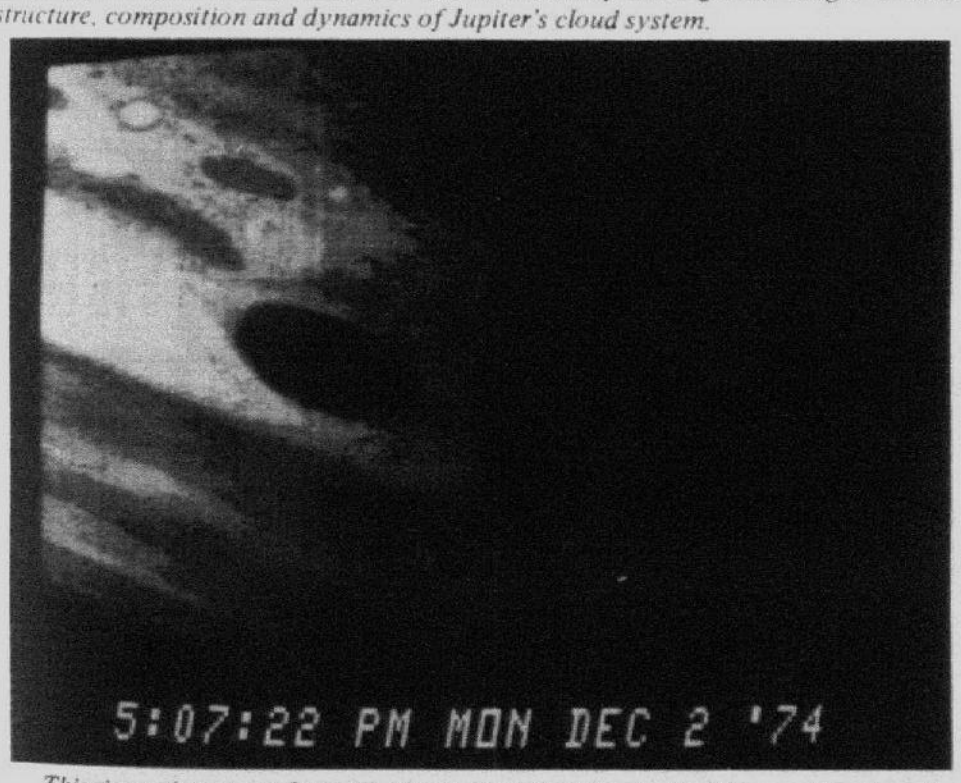
National Aeronautics and Space Administration • Ames Research Center, Moffett Field, California

A Triumphant Encounter for Pioneer 11

This Pioneer 11 image of Jupiter and the third Galilean satellite Ganymede was sent to Earth about 9½ hours before the spacecraft reached its closest approach to the largest planet in the solar system. The picture was made at 11:59 a.m. (PST) Dec. 2, while Pioneer 11 was 463,000 miles above the planet and traveling 44,180 miles an hour.

The image shows how Pioneer 11 reached much higher latitudes than its predecessor Pioneer 10, and is expected to return the first clear view of the planet's polar regions. The image will receive extensive processing by the University of Arizona's imaging photopolarimeter team, and will be used to provide greater insight into the structure, composition and dynamics of Jupiter's cloud system.



This is an image of Jupiter's Great Red Spot made by Pioneer 11 when the spacecraft was 238,000 miles from the planet and traveling 56,550 miles an hour.

The image was made just four hours and 16 minutes before Pioneer 11 made its closest approach to the Jovian cloud tops at 26,000 miles altitude. At closest approach, Pioneer reached 107,000 miles an hour — the fastest any man-made object has ever traveled.

(Right) This picture was returned to Earth by Pioneer 11 less than eight hours after the spacecraft flew within 26,000 miles of the cloud tops of Jupiter. The image, taken by the Pioneer 11 imaging photopolarimeter, shows northern belts and zones (lower right quadrant) and the relatively featureless north polar regions (upper left).

Experts at the University of Arizona will process the image with special computer programs to remove distortion and to enhance the contrast and color reproduction of the image.

Pioneer 11 dipped exceedingly close to the surface of Jupiter Monday night and then sped toward Saturn, its systems intact.

The spacecraft, silent for nearly an hour, emerged from behind the giant planet and signaled to earth – 455 million miles away – that it was still functioning.

Scientists and onlookers broke into applause at Ames Research Center as a teletype told them the craft had survived Jupiter's intense radiation belt.

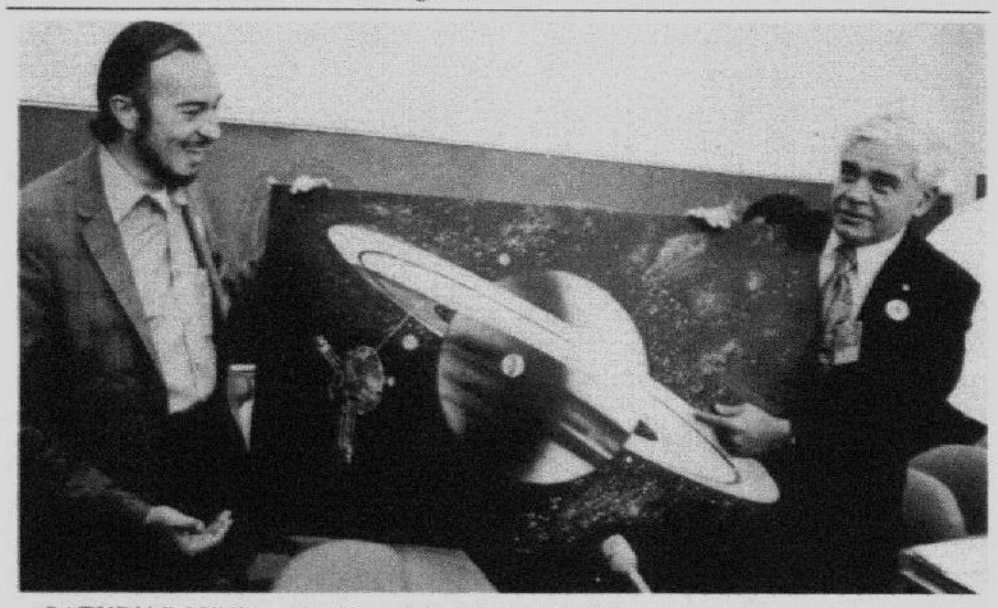
"We've got it!" someone in Pioneer Control shouted.

Rapid analysis of data showed that some of the 12 instruments aboard had malfunctioned due to a heavy bombardment of high-energy protons and electrons near the Jovian equator.

But the problems can be corrected, project manager Charles Hall stated.

The 570-pound, unmanned craft ducked behind Jupiter at 9:41:56 p.m. PST, 11 seconds behind schedule, and broke off radio communication.

(Continued on Page 3)



SATURN-BOUND – Charles F. Hall (right), NASA Pioneer Project Manager, and Dr. John H. Wolfe, Pioneer Project Scientist, show on painting how Pioneer 11 will fly past Saturn in early September 1979.

Children's Xmas party set for December 14

The Annual Children's Christmas Party will be held Saturday, December 14, from 10:00 a.m. to 2:00 p.m. in the Flight Support Facility (Building 211). All ARA members, their spouses, children and grandchildren are invited to attend. ARA membership includes all Federal Civil Service Employees at Ames, all retired Ames employees, and all on-site contractors.

Free admission tickets will be furnished to eligible children twelve (12) years of age and younger. There will be a 50 cent charge at the door for children without admission tickets. Children who purchase admission tickets at the door will not be guaranteed a gift.

Children over 12 years of age and adults will be admitted with a $1.25 subscription-raffle ticket which will also be good for the prize drawings. Subscription-raffle tickets are being sold by your organizational volunteer, any ARA Board member and at the ARA store in the Ames cafeteria.

NASA Science Foundation signs agreement

The National Science Foundation (NSF) has signed a memorandum of understanding with NASA for collaboration in research on terrestrial uses of solar energy.

NSF is the lead Federal agency in solar energy research. A National Solar Energy Research Program, developed through interagency studies under NSF leadership, aims at achieving significant contributions to the United States energy supply by the 1980's. Success of the program, involving a budget of about $1 billion in the next five years, could result in savings up to several millions of barrels of oil per day by the mid-1980's.

The NSF-NASA agreement is one of a number through which NSF will collaborate with other Federal agencies having a present or prospective role in bringing solar energy systems into widespread use.

NASA, already working on wind energy systems in NSF-supported solar energy projects, is expected to have a part in the full range of solar energy research.

The areas of research in the NSF program include:

- Heating and cooling of buildings in a wide variety of types and sizes, including agricultural structures for such purposes as animal shelters and crop drying, by systems using solar collector arrays.
- Solar thermal conversion to obtain high temperature thermal energy to drive central station electric generators or to provide process water for industry.
- Wind energy conversion, which in its most familiar form uses windmills to provide electrical or mechanical power.
- Bioconversion to fuels, by which gaseous, liquid, or solid fuels are obtained from plant materials, plant wastes, marine growths and municipal solid waste.
- Ocean thermal energy conversion, which uses temperature differences between surface waters warmed by the Sun and cool deeper waters to drive generators producing electricity for transmission direct to shore or convertible to chemicals such as hydrogen for storage or movement to shore use.
- Photovoltaic conversion, the use of "solar cells," which convert solar energy directly into electricity.

Industry, universities, and private research organizations are taking part in the research program.

Widespread use of solar energy systems is expected to alleviate energy shortages abroad as well as domestically, to enhance U.S. self-reliance in energy supply, and to improve the nation's trade balance position both through reduction of energy import requirements and the export of solar energy technology.

Some up-to-date NASA highlights

NASA/Headquarters – Spacecraft such as the Synchronous Meteorological Satellite and the Applications Technology Satellites which are in synchronous orbit at an altitude of 36,300 kilometers (22,300 miles) scan the entire Western Hemisphere every 30 minutes for the National Weather Service.

NASA/Headquarters – Major program areas covered by NASA's Office of Aeronautics and Space Technology include: experimental engines; flight experiments; research and experimental vehicles; operating experiments; and systems technology.

NASA/Headquarters – Horizontal test flights will begin in 1977 on NASA's Space Shuttle, a reusable space vehicle which will be operated as a transportation system for a wide variety of space missions in low Earth orbit. The Shuttle will deploy scientific and applications satellites of all types.

NASA/Headquarters – Spacelab, a versatile new laboratory which will be carried in the cargo bay of NASA's Space Shuttle in the 1980s is being developed, manufactured and funded by the European Space Research Organization (ESRO). It will be staffed by as many as four persons during orbital flights that can last as long as 30 days.

NASA/Headquarters – Scheduled for launch in 1978, NASA's Seasat will be the first satellite devoted exclusively to collecting data for study of the ocean. It will circle the globe 14-1/2 times a day and observe all Earth's open oceans and coastal areas.

NASA/Headquarters – Two spacecraft will be launched on a 440-million-mile journey to Mars in the fall of 1975, arriving at the planet in July of 1976. NASA's Viking spacecraft will conduct scientific studies of the Martian atmosphere and surface, emphasizing the search for extraterrestrial life.

NASA/Headquarters – NASA's Applications Technology Satellite-6 (ATS-6) is being used by the Department of Health, Education and Welfare (HEW) to upgrade the quality of education and medicine in remote locations. Teacher-training courses, classroom instruction at elementary and secondary levels, medical consultations and medical lectures are typical of the ways in which this new satellite can be used.

NASA/Headquarters – The nation's first commercial domestic communications satellite, Westar-1, was launched last April by NASA for Western Union.

NASA/Headquarters – NASA's Mariner 10, the first spacecraft to explore the planet Mercury, swung by the planet for a second closeup look in September. On its second trip, the spacecraft photographed the sunlit side of the planet. Its first encounter in March was on the dark side.

NASA/Headquarters – NASA's Mariner 10, the first dual-planet mission to Venus and Mercury, was also the first mission designed to use the gravitational attraction of one planet to reach another.

Lightweight material tested in aircraft wings

Lighter, stronger, and longer-lasting aircraft through the use of composite reinforced structures is the objective of a joint NASA/USAF flight evaluation program.

Increased payload capability and reduced structural fatigue are sought in tests of a boron-epoxy composite reinforcement in two C-130 primary wing structures.

The boron-epoxy composite reinforced wing mid-section extends 36 feet in the center of the wing and includes mounts for the inboard engines of the C-130. The composite reinforcement allows use of a thinner gauge metal structure and the resulting 500-pound weight saving can be applied to increase aircraft payload or fuel. Because of their strength, composite materials increase the life of the structure by reducing its susceptibility to fatigue damage.

The first of the two C-130s was delivered to the Air Force Oct. 23. Both will be assigned to the 314th Tactical Airlift Wing at Little Rock Air Force Base, Ark.

Data obtained on the life of the composite materials and on their fatigue characteristics under flight conditions will help provide the confidence to proceed with their use in new aircraft design.

First flat electrical cable being put in private housing

Flat conductor electrical cable, originally designed and developed by NASA as electrical wiring for satellites, is being installed for the first time in private housing.

Under a cooperative program with the New York State Urban Development Corporation (UDC), the Marshall Space Flight Center is installing the flat cable in a surface-mounted, snap-on baseboard electrical system in six UDC-built apartments in Yonkers, N.Y.

When installation is completed and the apartments have been rented later this year, Marshall will begin a year-long evaluation of the system's performance in conjunction with UDC and Underwriters Laboratory. The flat cable and baseboard systems being used in the apartments have already been tested at Marshall and meet Underwriters Laboratory standards.

Advantages of the flat cable include low-cost installation and its thinness which makes it easy to conceal. It is equally adaptable for new construction and for rehabilitating and remodeling existing buildings.

The cable can be hidden in walls, under paper, paint, or paneling and under floor coverings such as tile, carpet, linoleum and rugs.

Because of its thinness, it can be stacked or layered for low-profile routing of many circuits. The snap-on cover baseboard system also cuts installation time.

The NASA portion of the project is sponsored by the Marshall Technology Utilization Office. James Hankins is the Center's flat cable project engineer.

NASA official speaks

Dr. George M. Low, NASA Deputy Administrator, participated in the dedication Nov. 16 of the new radio telescope at Arecibo Observatory in Puerto Rico.

The ceremonies marked the culmination of nearly five years of work on the improved facility, the largest of its kind in the world.

The 1,000-foot-wide metallic saucer, composed of 38,778 adjustable aluminum panels with new maser receivers and other advanced electronics, will permit astronomers to detect wavelengths seven times shorter than the present limit.

This in effect will permit astronomers to "hear" the faint sounds of space far more clearly than ever before.

In addition, the giant antenna will be able to study previously-discovered interstellar molecules such as ammonia, alcohol and formaldehyde – clues to the existence of life elsewhere in the cosmos.

The observatory is part of the National Astronomy and Ionosphere Center (NAIC), operated by Cornell University under contract with the National Science Foundation (NSF).

Don't Be A Victim

The holiday season offers a lucrative field of operation for the thief who specializes in ladies' handbags and purses. Most offices at Ames will be under manned due to annual leave schedules; and some employees will have extra money with them for Christmas shopping.

Don't have an unhappy Christmas because of carelessness. Be alert, protect your property and have a happy holiday season.

astrogram

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Editor . . . . . Meredith Moore
Reporters . . . . . NASA Employees

Deadline for contributions:
Thursday between publication dates

These five men will be the crew members for the joint U.S.-USSR Apollo Soyuz Test Project (ASTP) mission next year. They are: left to right, Astronaut Thomas P. Stafford, commander of the American ASTP crew; Astronaut Vance D. Brand, command module pilot of the American ASTP crew; Astronaut Donald K. Slayton, docking module pilot of the American ASTP crew; Cosmonaut Aleksei A. Leonov, commander of the Soviet ASTP crew; and Valeri N. Kubasov, engineer of the Soviet ASTP. They are holding a model of the American Apollo and Russian Soyuz spacecraft in a docked configuration as they will be during the mission.

Earth observations planned for joint US–USSR mission

When American astronauts and Russian cosmonauts work together on their joint space mission next summer, one of their major chores will be to observe closely their home planet Earth.

The Apollo Soyuz Test Project (ASTP), scheduled for July, 1975, is a joint endeavor by the two countries as part of the agreement on cooperation in space signed in Moscow in May 1972.

American astronauts in their Apollo spacecraft will rendezvous and dock with cosmonauts in a Soyuz-type spacecraft to test these docking systems in orbit.

In addition, the mission will prove out techniques by which, when docked, the astronauts and cosmonauts can transfer to and work in each others spacecraft; conducting experiments while both docked and undocked; and developing experience for potential joint flights by the two countries, including, in case of necessity, aiding one another in emergency situations.

As on the Apollo and Skylab missions, the American astronauts will take pictures and record their comments about the Earth as they observe features ranging from weather phenomena to volcanoes during the 10-day ASTP mission.

They will use Hasselblad 70mm cameras and voice recorders, with visual observations complementing the photographs.

The human eye's ability to distinguish dimly as well as brightly lighted objects, its extreme color sensitivity and the observer's vantage point in space will permit a better understanding of physical phenomena.

Types of features being considered for study on the ASTP mission include:

Studies of major active strike-slip fault zones in both eastern and western hemispheres and identification of extensions of fault systems by studying vegetation or drainage patterns.

Studies of closed-basin water circulation and shore lines as well as snow cover studies to be used later in conjunction with photographs taken of the Himalayas and hydrological studies of photographs taken over India plains and land areas inundated by rivers.

Studies of ocean upwellings and their hydrological and biological effects and of major trends of the ocean currents.

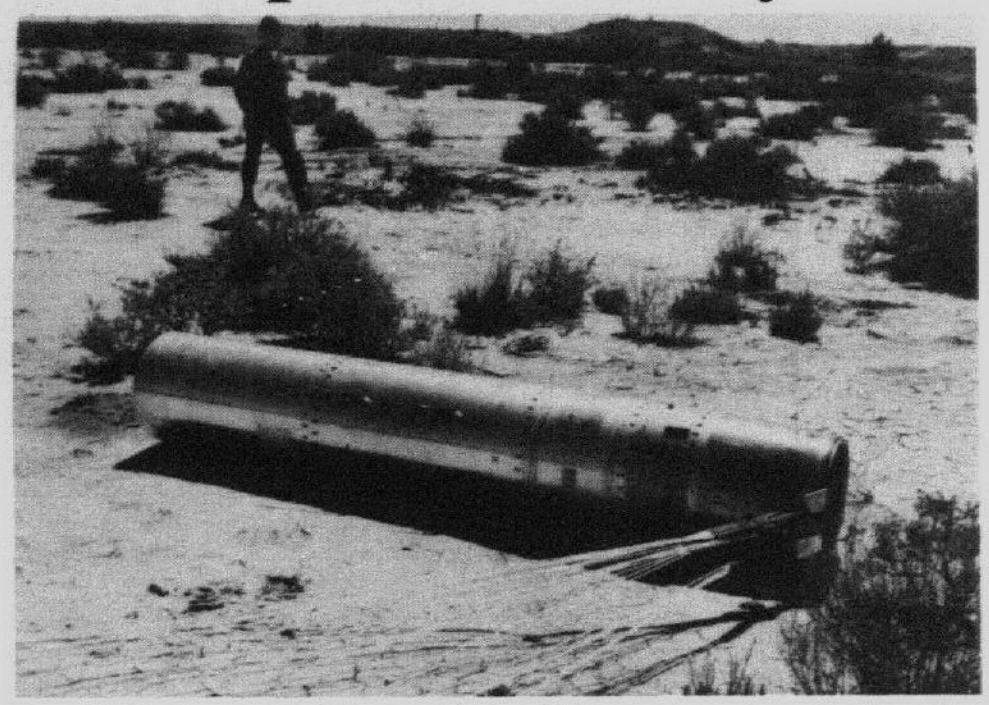
Visual observations of tropical weather problems such as frontal waves, tornadoes, storm centers and localized atmospheric circulations.

A day at the races

A large group of Ames employees recently enjoyed a fun day at the Bay Meadows horse races. The big winner was a friend of Sal Tardio's who won $294 in the exacta race. Other winners included Margaret Lundell (Library), June Zyskowski (Publications Office) and Mrs. Harry Nakayama who treated her foursome to dinner that evening.

Ralph Shawlee, Chief of Financial Management Division, gave out the "big tip" early in the day. It was in reference to a certain horse in the 9th race. Too bad more people didn't have faith in Ralph's tip as the horse came in first!

Sparcs recovery



Guided by a helicopter, recovery crews drive to the spot on the White Sands Missile Range where the SPARCS control and payload section have parachuted from space. Both elements of the sounding rocket can be refurbished and reused. SPARCS (Solar Pointing Aerobee Rocket Control System) has guided more than 50 solar scientists' experiments up to 200 miles above the Earth to study the Sun. SPARCS is a joint development of Ames Research Center and Lockheed Missiles & Space Co.

Bert Rock receives achievement award

Bert P. Rock (middle), senior engineering technician for the Flight Simulator for Advanced Aircraft (FSAA) received a Special Achievement Award for his superior contribution to the FSAA operation. Rock has been responsible for the installation of all instrumentation and project electrical systems of the simulator for several years.

Presenting the award is Simulation Sciences Division Chief George A. Rathert, Jr. (right). Looking on is George R. Holden, former Chief of the Simulation Experiments Branch.

Pioneer Jupiter Encounter

(Continued from Page 1)

While invisible to earth, it approached to 26,000 miles above the planet's cloud layer, the closest any man-made object has come.

The spacecraft's course took it into Jupiter's highest concentration of radiation at a record speed of 107,000 miles per hour.

At 10:24:56 p.m., 25 seconds later than expected, the observatory at Canberra, Australia, received a signal. The spacecraft had rounded Jupiter, propelled by the planet's gravity.

Ten seconds later, the signal was confirmed by Goldstone Observatory in southern California.

One minute after breaking radio silence, Pioneer crossed the magnetic equator, the center of the planet's radiation area. More than an hour later, it left the area of highest radiation, and scientists relaxed.

At a press conference, NASA director J. C. Fletcher called the 21-month flight "fabulous" and announced that the spacecraft had been renamed "Pioneer-Saturn."

Speakers Bureau

(Will be delayed until next issue)

Basketball

It was youth regained Wednesday night as the Ames Basketball League enthusiasts played like the teenage stars they once were. In the first game of the evening, the Jets launched their comeback drive from the cellar by downing ARO 43-22. Bruce Ganzler stuffed in 12 points for the Jets. The second game was a battle royal between the Fighting Pumas and the Beer Barrels. Using a full-court press, the Pumas led until the last few minutes when the Beer Barrels came from behind to win 36-33. Mladen Chargin led the victors with 16 points while Len McCulley scored 14 for the Pumas. The Spoilers remained undefeated by dropping MAD 41-24 in the final game of the night. Paul Kutler paced the Spoilers with 13 points. The Spoilers and Beer Barrels are tied for first place in the standings.

Flu shots

Many employees have been inquiring about the possibility of receiving flu shots from the Ames Health Unit. Dr. Hughes, Chief of the Health and Safety Office, would like to announce that the only people eligible to receive flu shots at the Health Unit are senior citizens, the debilitated, those individuals having serious respiratory problems, and those who have been advised to do so by a physician.

All other individuals wishing to obtain flu shots must see their own physician.

San Jose Chorus

The San Jose Chorus will present its annual Christmas program at the Scottish Rite Auditorium, North 3rd at St. James Sts., Dec. 7 and 8. Saturday evening Dec. 7th at 8:00 p.m. Respighil's "Laud to the Nativity" plus carols written by former founder and director of the Chorus Mr. Leroy V. Brant, and one written by his daughter Miss Verne Brant entitled "Three Kings" will be given.

Sunday afternoon Dec. 8th at 3:00 p.m. the traditional Handel's "Messiah" with Dr. Reginald Greenbrook directing and the following soloists: Lorraine Grundke, soprano; Walda Bradley, alto; John Farpelha, tenor; Stanley Neff, bass.

Accompanying the Chorus will be pianist Rose Marie Rushin and organist Richard Stanley.

The concert is open to the public, but seats in the reserved section may be had by calling San Jose Chorus 377-3843.

CHECK YOUR DECAL!

Ames employees with vehicles registered with a NAS Moffett Field identification sticker are reminded that it is their responsibility to ensure that the decal does not expire.

Savings Bond sales are up

(Taken from the Palo Alto Times)

When times get tough and the stock market goes down, sales of U.S. Savings Bonds go up, according to J. Quent Williams, regional director for the Savings Bond Division of the Treasury Department.

"We don't like to put it that way," he said, "but it's nevertheless true."

Savings bond sales are up now.

In Santa Clara County, 175,000 people are enrolled in payroll deduction plans to buy bonds, according to John O. Buerger, area manager in San Jose.

Volunteers are the key to the savings bond program, however. The government has only 165 bond salesmen but 100,000 volunteers.

The Treasury has $63 billion outstanding in savings bonds, Williams said, 24% of the publicly held portion of the national debt. The average bond is held seven years before redemption.

The interest scale starts out low in the first years and ends up high, encouraging bond longevity.

Franklin Roosevelt bought the first E Bond in 1941. It carried an interest rate of 2.9% and reached face value in 10 years. A bond bought then for $18.75 would be worth $60 now, Burger said.

Last December the rate for E Bonds held to maturity was raised from 5.5% to 6%. The bond can be turned in after 60 days. It pays no interest if redeemed in six months. Interest starts at 4.5% and ends up at 9%.

Income tax on the interest is deferred until the bond is cashed, Buerger said. The tax can be further deferred by trading mature E Bonds in on 10-year H Bonds paying 5.5% the first five years and 6.5% the second five years. Tax is paid only when the H Bonds are redeemed.

Holders of H Bonds receive interest in quarterly checks.

Williams said bonds compare favorably with regular bank savings accounts in interest and safety, but he said they are more complementary than competitive.

"Sixty percent of all the money that goes into bonds comes from payroll savings," he said. "It is new savings, not savings taken from banks and savings and loan associations."

Commercial banks issue 80% of savings bonds, receiving only 15 cents per bond, or in large volume, 10 cents per bond. Williams said the bank's cost is 45 cents per bond.

There have been complaints that the little guy can get only 6% interest on his savings bond, while the richer man who buys Treasury Bills can get 9%.

Williams said the bond is geared to the saver; the bill to the investor.

"People complain of tax breaks for the rich, and then they fail to take advantage of the tax break savings bonds offer," Buerger said.

Treasury Bills have occasionally been offered in denominations as small as $1,000, bringing howls from savings institutions about a drain on mortgage money.

WANT ADS

Transportation

'64 TR-4 – new top & paint, wire wheels, body & engine good, $1100. Call Pat after 5:00 p.m., ext. 5131.

FOR SALE: '71 VW Super Beetle. Auto, radio, 41K. Brakes, tires, shocks recently replaced. 1 owner, excellent mechanical and body condition, full service record. Leaving country, must sell, $1495/offer. Available end of December. Call 965-1840 eves.

FOR SALE: 4 Mags (5 Lugs). Call 288-9755 eves.

FOR SALE: VW Seats, like new, high backs. Call 288-9755 eves.

'66 Charger, Radials etc., make offer. Call 288-9755 eves.

'68 Austin A., 35 mpg & Autom. Call 288-9755 eves.

'70 Austin A., 35 mpg & Std. Call 288-9755 eves.

'57 VW Body (no eng), make offer. Call 288-9755 eves.

FOR SALE: VW Engine. Call 288-9755 eves.

FOR SALE: 1972 Vacationer 8-Ft Cabover Camper, sleeps six, $800. Call 967-2922 after 5:00 p.m.

NASA employees Travel club

The NASA Headquarters Employees Club has decided to sponsor three tours for 1975. All NASA employees, their immediate families and direct affiliates, and in some cases, friends will be eligible. Included are winter, summer and fall tours:

Russia, 8 days,
February–March 1975
Orient, 19 days,
June–July 1975
Holy Land, 14 days,
Fall 1975

Detailed information can be obtained by writing B. Maggin, Chairman, Travel Committee NASA Headquarters Employees Club, Code R, NASA Headquarters.

Blood needed

I have a relative now in Kaiser Hospital in Santa Clara with leukemia. He needs blood transfusions. This is an appeal for anyone wishing to help by donating blood in his name – Jeff Rogers. The Red Cross blood bank at Ruff and McKendrie (near Civic Center) is open Mon 8 – 6, T&Th 9 – 6, Wed 9 – 1, Fri 8 – 4, and Sat 9 – 12. The phone number there is 292-6242.

Thanks and appreciation.
Jim Rogers

Housing

FOR RENT: 2 furnished rooms and bath in private home. Suitable for 1, private entrance, near El Camino Hospital, garage privileges. $135 including all utilities. For appointment call 968-3089 after 5 p.m.

Miscellaneous

For Sale: Bicycle, boy's 5-speed "Raleigh Chopper," excellent condition, $55. Phone 379-4305.

Black Appaloosa gelding, registered 15.3, 8 yrs., excellent for trail, good conformation and disposition, possible "Gymkhanna," endurance or jumper. $550 Sound., saddle $150. Call 846-6027.

FOR SALE: Fairbank Platform Scale, 900-lb cap, asking $50; Old buffet, asking $40; 1-H/P Elect. motor go cy 115V, asking $40. Call 227-5307.

I am interested in sharing in a car pool. I live 4 blocks behind Valley Fair in San Jose going toward Santa Clara. My working hours are 7:30 a.m. to 4:00 p.m. My phone number is 965-5140 (work) or 296-7869 (home).

FOR SALE: 12' Aluminum Boat, 7½ HP motor, trailer and spare tire, $350 all. Call 961-8239 eves.

FOR SALE: 19" B/W port TV, needs power pack, $25; Sofa-bed, good mattress, needs upholstering. $30. Call 247-3187.

USED FURNITURE FOR SALE: Bed, stereo, TV, chest of drawers, lamps and many others, very cheap. Leaving country, must sell. Call 965-1840 eves.

San Francisco Symphony at Flint Center, Cupertino. Two 6th row center Orch. tickets for each of the following Sat. eves: March 8 and April 5, $7.75/ticket. Call 961-2782.

WANTED: Hi Fi or Stereo System, record changer, amplifiers, speakers. Will pay up to $100. Call 326-5730.

Missing typist chair: Left at front entrance of Life Science Building. Please return to Life Sciences Library. No questions asked.

We are looking for a home for a dog. He is part Lab and part ?, black with brown markings, and approx. 1 yr. old. Contact Bruce Smith, 253-1515.

DIAMOND RINGS: Broke engagement – must sell rings 5 yrs. old. Asking $500. Lifetime guarantee. Call 651-0336.

FOR SALE: King-size bed, including firm mattress, box springs and frame, $75. Call 736-8793.

Will have shelled walnuts available by December 1. Will deliver to Ames on December 3 – $1.50/lb. Please call Irene Tharpe 408-779-3022.

national aeronautics and space administration

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ames research center, moffett field, california

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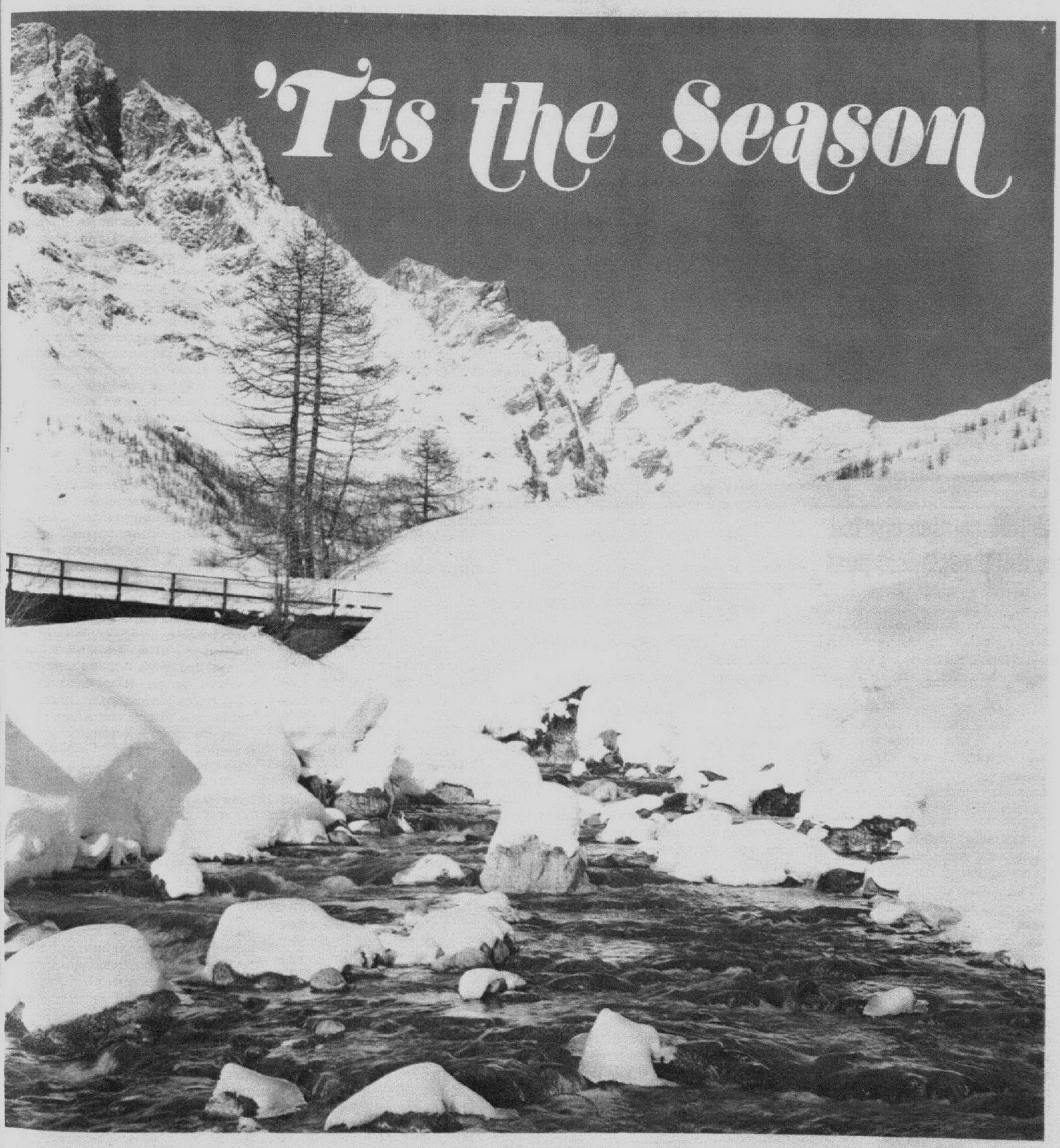

'Tis the Season

Pioneer Jupiter Educator's Conference

One hundred teachers of astronomy, chemistry and physics from high schools and colleges representing 15 states and Canada participated in a 2-day Educators' Conference at Ames during the Pioneer Jupiter Encounter. Other participants included planetarium directors.

The program was under the direction of Ames' two Educational Programs Officers: Garth Hull and Mike Donahoe, assisted by Barbara Busch.

Key speakers included Dr. John Billingham, Chief of Ames Biotechnology; Principal Investigators for Pioneer 11 Dr. James A. Van Allen and Dr. John A. Simpson; Dr. Robert S. Kramer, Director of Planetary Programs, NASA Headquarters; Erick Burgess, Co-founder, British Interplanetary Society; Dr. Brad Smith, Professor of Planetary Science, University of Arizona; and Dr. Donald McDonald, Minolta Planetarium.

Tour sessions included a bus tour of Ames, a visit to the Auditorium to the Pioneer exhibits, and selected research facilities.

During the curriculum orientation and resources sessions, special publications were given to the participants and available educational services provided by NASA were discussed.

AMRDL civilian elected to NATO technical post

A U. S. Army civilian aviation research engineer here was elected chairman of one of the eight technical panels of the Advisory Group for Aerospace Research and Development (AGARD), North Atlantic Treat Organization (NATO).

Dr. Irving C. Statler, Director of the Ames Directorate, U. S. Army Air Mobility Research and Development Laboratory (AMRDL), was elected to a two year term as Chairman of the Flight Mechanics Panel at the panel's 45th meeting held October 18 in Paris, France.

The AGARD panels work to bring together the leading personalities of the NATO nations in the fields of science and technology relating to aerospace to recommend the use of the NATO R&D capabilities, provide scientific and technical assistance to the Military Committees and stimulate technical advances through international cooperative effort and data exchange.

AGARD was established as a NATO Military Agency in 1952 to provide the scientific and technical support relating to aeronautical research and development. The early reliance on AGARD to pool the aeronautical research among the member nations and to exchange scientific and technical information has steadily grown.

Scientists uncover clue to Io's glitter

The phenomenal glitter of Io, one of Jupiter's large moons, may be due to a surface rich in salt, according to a team of scientists at the Jet Propulsion Laboratory.

Io appears to have developed an extensive crystalline layer of sodium, much like some of the salt flats and dry lakes in the American West, Dr. Fraser P. Fanale, Team leader, said this week.

"Io's situation is somewhat analogous to that of an Earth whose oceans have evaporated," Finale explains, "except that the salts are not dominantly sodium chloride (table salt), but sulfates which dominate in the so-called "bitter" lakes of the West. Examples are Verde Valley Lake in Arizona and Soda and Searles Lakes in California."

Astronomers have long regarded Io as a very odd moon. It is highly reflective and nearly as red-orange as Mars. Innermost of the four large Jovian moons discovered by Galileo, Io is slightly bigger than Earth's Moon (diameter 2,262 miles and orbit distance of 262,000 miles from Jupiter). It is one of the brightest small objects in the sky, on many nights being visible with binoculars.

Sodium vapor emissions from Io were first reported last year by Harvard astronomer Dr. Robert Brown. He found that a glowing cloud of sodium vapor extends 10,000 miles from Io's surface.

The Pioneer 10 flyby last December also found a cloud of hydrogen atoms at Io.

Further closeup investigation may come in 1979, when a Mariner spacecraft flies past Jupiter carrying a telephoto lens equipped with a special filter for imaging Io. The spacecraft then will proceed to Saturn.

"The sodium emissions from Io are analogous to those in powerful sodium vapor lamps," Fanale observes. Sodium proton sputtering at Io's poles and its interactions with Jupiter's potent magnetic field pose serious survival problems for spacecraft.

The year-long study resulted in a startling new picture of Io's origin, evolution and present environment.

Dr. Fanale and his colleagues, Drs. Torrence V. Johnson and Dennis L. Matson, evolved their theory after employing such diverse techniques as proton beam bombardment of salt samples in a laboratory, chemical and optical analyses of meteorites, and spectral observations of Io at JPL's Table Mountain Observatory.

The investigators found that the visible and infrared spectra of several salts, including salts extracted from carbonaceous meteorites, match Io's spectrum closer than materials previously suggested. (Carbonaceous meteorites are the oldest space rock yet discovered. Spectral readings are the astronomer's and chemist's means of determining elements. Each chemical component has its signature color line.)

ALSEP 12 five years old and still going strong

Five years ago two American astronauts placed and left on the Moon a remote scientific instrument package. Five years and over 21,000 Earth-to-Moon commands later this set of instruments continues to radio back to Earth information about the Moon's seismic activity, the energy hitting the surface from the Sun and the Moon's weak magnetic field.

Original specifications for the Apollo Lunar Scientific Experiment Package (ALSEP 12) called for the instruments to last for one year after the return of Apollo 12 astronauts Pete Conrad, Alan Bean and Richard Gordon.

Don Wiseman, one of the men originally responsible for the hardware development at Johnson Space Center (JSC), attributes the long life to basically simple design with basically durable materials. "It was a bare bones design; basically sound," Wiseman said.

The need for remote data from the Moon centered about certain questions best answered with continuing data from which a trend could be established; questions like what is the Moon's internal structure and temperature, what processes are responsible for the present structure of the lunar surface, what is the pattern and distribution of seismic activity on the Moon, how do solid body properties and processes on the Moon compare with those on Earth?

The ALSEP series which included similar packages for Apollo missions 14 through 17, was designed to return lunar scientific data to Earth in the areas of geology, geophysics, geochemistry and astrophysics.

Although there were earlier instrument packages which were soft-landed on the Moon prior to the Apollo missions, the ALSEP packages have been the longest lived, most sophisticated package of sensors ever designed and placed on the Moon.

Dr. Palmer Dyal, a NASA lunar investigator at Ames, has derived measurements of the Moon's magnetic field from the Apollo ALSEP magnetometers. His estimates show the Moon's magnetic field to be about 1,000 times weaker than the Earth's and the result of a probable one-time magnetism. No significant dipole field exists on the Moon at present – which means a magnetic compass would be absolutely useless on the Moon. The Earth's field, in contrast, derives from internal processes of our planet.

A powerful magnetic field is generated deep within the Earth by the constantly rotating molten metal core. This core functions like a dynamo and develops a field measurable many thousand miles into space. In contrast, the main lunar magnetic field consists of near-surface fields highly variable in magnitude and direction.

Dyal says "that the lunar magnetic field can be viewed as a sort of magnetic tape recording of conditions on the Moon more than three billion years ago." These investigations have also led to other tentative conclusions concerning the interior structure of the Moon. From magnetic data Dyal has figured the abundance of free iron on the Moon at about 2.5 percent by weight. Total iron content of the Moon is about 9 percent by weight. The Earth is about 30 percent iron by weight.

Signals received by the seismometers have definitely established the existence of Moonquakes. These are associated with activity deep within the Moon 700 to 1,200 km (420 to 720 mi.) and with shallow activity produced by thermal heating and cooling during the lunar day and night. A third class of seismic events may be associated with processes within the lunar regolith.

One of the most surprising results was the long duration and ringing nature of seismic signals from the Moon – completely different from that observed here on Earth. This is explained by the diffusive propagation of the shock waves as a result of intense scattering, particularly near the lunar surface. The diffusion is enhanced by low attenuation due to the lack of water and other volatiles in the pores of the lunar rocks. For this reason, seismic studies based on reflected signals cannot be used to the same advantage on the Moon as they are on Earth.

Seismic energy of the Moon has been found to be about 10 orders of magnitude less than the Earth's, and due to the Moon's thick lithosphere, there is no crustal plate movement like on Earth.

The heat flow measured by ALSEP instruments was surprising. It is about half that of the Earth's. It places strong constraints on the radioactivity of the Moon and indicates differentiation and upward concentrations of radioactivity early in the Moon's history. Previous models of the Moon's radioactivity were based on chondritic meteorites and terrestrial rocks. Bulk radioactive concentrations consistent with the heat flow measured on the Moon indicate that those models are inaccurate. Other findings indicate that, in comparison to the Earth, the Moon is depleted in volatile elements like iron, sodium and potassium.

Data from the five ALSEPs is received by NASA's tracking network 24 hours a day. This information is stored on computer tapes and mailed to the Johnson Space Center. The computer tapes are duplicated and sent along to the dozen principal investigators still analyzing the data. Through the National Space Science Data Center data tapes are made available to the scientific community at large. Several times each week, NASA engineers and technicians monitor the ALSEP instruments "live" from the Moon looking for problem areas or performing general maintenance checks.

Simple method relieves "cafe coronary"

About ten people die needlessly in the United States every day while eating, because they choke on a piece of food. Their lives could be saved by a simple first aid maneuver that anyone can perform after a few minutes instruction.

Henry J. Heimlich, MD, director of surgery at Jewish Hospital in Cincinnati, Ohio, has developed a way to deal with "cafe coronaries," as these lethal choking incidents are frequently called. And there is already evidence that this method works.

The Heimlich maneuver is simplicity itself: The rescuer stands behind the victim, holding him with both arms around the waist, at or just above the belt line. The rescuer grabs one of his own wrists firmly, then squeezes hard while allowing the victim to slump forward, head and arms dangling.

There is always some residual air in the lungs, Dr. Heimlich points out, and the pressure below the diaphragm compresses this air. The bolus pops out "like a champagne cork."

If the victim has already collapsed, the rescuer need not pick him up. If the victim is face down, the rescuer can straddle his buttocks; if he's face up, straddle his thighs. In either case, the rescuer places both hands (one on top of the other) just below the diaphragm and pushes sharply toward the victim's head. The procedure is repeated if necessary, and if possible, a bystander should be ready to scoop up the ejected food so it isn't inhaled again.

The risks of this method are minimal — some rescuers have grasped the victim too high and have cracked a few ribs — the alternative is death or irreversible brain damage.

The only modification for infants is that less pressure is needed. The handiest position might be to place the child across the knee, so the leg presses the abdomen below the diaphragm as pressure is applied upwards along the lower part of the child's back.

New book of interest

A book which explores the work of several Ames scientists has been published by Doubleday for general readership audiences and is just arriving at local bookstores.

The Earth in the Looking Glass, by Lloyd Darden, describes in everyday terms the use of earth resource satellites for locating food and energy sources, and for monitoring pollution and earthquake faults. Some of the Ames scientists and projects discussed are Dr. Ron Reinisch and Hermie Gloria on air pollution; Dr. Ellen Weaver on water pollution, and John Arveson and John Millard on the locating of productive fishing waters — all through the use of "looking glass" satellites.

Darden's book is designed to tell the non-technical reader the many earth benefits of the space program.

Xmas planetarium program in Spanish

Spanish speaking people of all ages, and students of the language, will be able to attend a free Spanish language planetarium program about the Christmas season December 14–22 in the Foothill College Planetarium.

"Night of the Kings," produced by the observatory staff in cooperation with the Multicultural Relations Department, as a community service, will have six public performances during the two weekends.

Special group performances may be scheduled for Monday through Friday, December 16–20 by calling Foothill Community Science Services, 948-8590, ext. 381, by Friday, December 13th. The group programs are also free to any school, church, or other organization wishing to bring 20 or more people.

The scheduled public shows, lasting about one hour, are at 2:30 and 7:30 p.m. Saturdays, December 14 and 21, and at 7:30 p.m. Sundays, December 15 and 22.

Standards of conduct

Government agencies are directed to maintain on file Statements of Employment and Financial Interests for each employee required by regulations to submit such a statement. This memorandum sets forth the procedures to ensure that the Ames Research Center meets its responsibilities to ensure that records are complete and updated on a timely basis.

Each supervisor will review the criteria for defining the categories and types of employees who must file the required statement. The criteria is listed in NHB 1900.1A, Part B, Section 404.

Upon review of the criteria, each supervisor will determine which of his employees properly meets the criteria. The supervisor will then submit a list of these employees to the Personnel Division (Mail Stop 241-9). Supervisors must submit these lists not later than December 20, 1974. The Personnel Division will then furnish each employee identified with a copy of NASA Form 1270. The employee will promptly return the completed form to the Personnel Division. The Personnel Division will maintain the file and provide for an update on an annual basis.

Questions pertaining to this memorandum may be submitted to Herbert W. Carlson, extension 5619.

Toastmaster officers

The Jetstream Toastmasters Club, which includes a number of Ames staff as members, has just elected Calvin Fenrick (Equal Opportunities Programs Office) as President for the January–June, 1975, term of office.

Elected to the position of Administrative Vice President was Barbara Busch (Educational Programs Office). Ames employees interested in discussing the goals of Toastmasters or visiting a club meeting are encouraged to contact Cal, Barbara or Guy Ferry. Guy is one of the organization's International Directors.

Women: Your year has come!

The year 1975 has been proclaimed International Women's Year. Many states, counties, and cities in the United States have already made resolutions and proclamations to this great event. The United Nations originated, in December of 1972, the designation of 1975 as a year to focus attention throughout the world on the status of women and to promote equal partnership.

On January 30, 1974, the President of the United States also proclaimed 1975 as I.W.Y. He called upon all of us to help begin work now to provide the observance of the year with practical and constructive measures for the advancement of women, and also to cooperate with the activities to be arranged by the United Nations.

Women and men at Ames will be observing I.W.Y. The kick-off date for I.W.Y. is January 10th. The E.E.O. Women's Advisory Group has begun working on plans to bring in the International Women's Year with a bang. Keep your eyes and ears open for more information on the Kick-Off Luncheon for I.W.Y., featuring Ms. Shirley Zimmerman as guest speaker. Ms. Zimmerman has been active in the Women's movement since 1970. She's also worked as coordinator with other various citizens action groups. She is currently the women's coordinator for the County of Santa Clara and is responsible for developing an effective means of dealing with the feminist issues. Ms. Zimmerman has some interesting ideas on the structure of power, how women can deal effectively with those who have power and how to overcome their own sense of powerlessness. She is a very interesting speaker and I'm sure we'll all get something from her speech.

If you are interested in helping the W.A.G. in any part of the planning, please contact Dorothy Davenport (Chairperson, W.A.G.), at ext. 5011 or Annette Laboy (E.E.O. Office) at ext. 6510.

Credit Union

Join Moffett Field Employees Credit Union's new Magic Four savings program and you may win the Getaway. It's a Getaway to wherever you want to go in the United States, excluding Alaska and Hawaii.

Take part in the Magic Four drawing and you could win this luxurious round trip by air coach for two to any airport serving scheduled airlines in the United States. In addition, you'll receive $500.00 in travelers' checks for spending money. It's a dream waiting to come true.

We've put the Getaway together to get you acquainted with MFECU's Magic Four savings program. From October 1 to December 31, you can get tickets in the drawing by participating in the Magic Four.

Give your children something they can't lose or break this Christmas U.S. Savings Bonds, the ongoing gift with a great future.

About "FWP"

Most people know that women constitute 51% of the total population, but many do not realize that about half of all women between the ages of 18 and 64 are presently employed and that studies show nine out of ten women will work outside their homes at some time during their lives.

Why do these women work? Contrary to the old myth that women work for "pin money," the fact is that most women are in the labor force because they or their families need income. According to the Department of Labor's studies, the majority of these women are either single, widowed, divorced, or married to a husband earning less than $7,000 per year. Yet these women who are working to support themselves and/or their families will earn, on the average, substantially less than their male counterparts, studies show.

Why do women earn less? The reasons vary. For some, it may be attitudinal problems on the part of their supervisors, their families, or even themselves. For others it could be poor career planning; they find themselves locked into "dead-end jobs." Still others lack training opportunities which would prepare them for executive level jobs.

To raise the focus of attention on women, President Nixon issued Executive Order 11478 in 1969 which integrated the Federal Women's Program into the overall Equal Employment Opportunity Program. Since that time the FWP has become a part of the EEO Affirmative Action Plan with the ultimate goal of enhancing the employment and advancement opportunities for women in the Federal Service.

The general aims of the Federal Women's Program are: to provide career counseling of women in lower level positions to orient them to opportunities within the agency; to insure that women who are interested are involved in training programs, including those for mid-level, senior level and supervisory positions; conduct outreach recruitment efforts to attract qualified women in selected occupations; and to dispel some of the generalizations and myths concerning working women that may keep them from progressing as fast and as far as their abilities could take them.

Speakers Bureau

Barbara Busch, Manager

On December 3, Donald Ciffone (Large-Scale Aerodynamics) traveled to San Luis Obispo to address the Student Section of the AIAA, sponsored by Cal Poly. Don's presentation was "Wake Vortex Studies."

Also on December 3, James Connolly (Electro-Systems Engineering Branch) addressed the Student Chapter of the IEEE at San Francisco State University. Jim discussed Ames' work in biomedical instrumentation and applications.

Lt. Col. Alfred Worden (Chief, Systems Studies Division) took time out from his moderating of the TV reports of the Pioneer 11 encounter to address the Los Altos Rotary Club on December 4. Al's presentation on NASA's space programs was entitled "View from Space."

On October 23 a group of 30 students from Patrick Henry School in Sunnyvale visited Ames. The class of 7th, 8th, and 9th graders, called "Computer Theory," was hosted by Toby Gonzales, Chief of the Computer Operations Branch. Toby was assisted by Dave Henderson and Jim Jeske. The students were shown the 1800 computer, visited the central computer facility, and were generally briefed on Ames' computational capabilities.

Eugene "Gino" Pucine (Scientific Applications Analysis Branch) visited two schools in San Jose on November 1, to talk about our nation's space program. In the morning he talked to a science fiction class at Westmont High School about Ames' computation work and about the Pioneer Project. In the afternoon he gave two groups of 5th and 6th graders at Forest Hill Elementary School an overview of the Pioneer Project and Ames' and NASA's work.

Robert "Skip" Nunamaker (Deputy Manager, Pioneer Project) addressed the members of the Cupertino Rotary Club at their meeting on December 11. He discussed the up-to-the-moment information being learned from Pioneer 11, and outlined for the group the future Pioneer-Venus mission.

Barbara Busch (Educational Programs Office) will be addressing the Campbell Optimist Club at their morning meeting on December 26. Her presentation on "Man and Cosmos" will discuss the way in which NASA is helping to expand mankind's view of the universe.

SAVING FUEL

If every automobile consumed just one less gallon of gasoline a week, the nation could save about 340,000 barrels of fuel per day. Most automobiles get 10 to 20 percent more miles per gallon when driven at 50 miles per hour than they do when driven at 70 miles per hour. If everyone drove at the 50 MPH rate, national savings in gasoline would be about 250,000 barrels of fuel each day. These two practices would save over 200 million barrels of gasoline a year.

Joggernauts: D'aloia and Shute win trophies

Vito A. D'aloia, SP, and Dale Shute, Instrumentation Division, retired, won two of the eleven trophies awarded at the First Annual "Dogfood" race held at Foothill College on November 17 and sponsored by the Joggernauts. Of the 106 official finishers, Vito crossed the finish line in seventh place and Dale crossed the finish line in tenth place. Although this race was handicapped in the conventional manner for the age and sex of the runner, an additional 3 6 minute handicap was given all those runners who had not won a trophy in the last 3 years, i.e., the runners who are typically left at the starting line by the dozen or so top runners to become "dog-food" for the neighborhood K-9 corps. This unusual handicapping system was enthusiastically welcomed by the vast majority of the runners.

The recently elected Joggernaut officers for 1974-1975 are Bob McCracken, president; George Lenehan, secretary/treasurer; and Bruce Castle, racing chairman. Any Ames or Ames Contractor employee, male or female, interested in joining the Joggernauts is urged to contact one of these persons.

CSC Training Courses

GENERAL MANAGEMENT TRAINING INSTITUTE

The following courses are given in January in San Francisco:

Creative Problem Solving in Management	January 6–10
Seminar on Organization Management	January 6–10
Introduction to Problem Solving	January 15–17
Organization Development for Managers	January 21–23
Introduction to Supervision	January 27–31
EEO Problem Solving: The Manager and the EEO Counselor	February 25–27
Workshop in Effective English Expression	February 25–28
Workshop in Environmental Management	March 10–14
Leadership & Supervisory Institute	March 18–20

MANAGEMENT SCIENCES TRAINING INSTITUTE

Introductory COBOL Programming	January 13–17
Metric Conversion	January 16–17
Cost Accounting in Government Operations	January 20–24
Types of Government Contracts	January 21–23
Data Processing Management and Administration	January 21–23

COMPUTER SCIENCES

Introductory Fortran IV Programming	January 27–31
Engineering Economics	January 27–31
Computer Performance Evaluation	January 28–30
Finance in Agency Management	January 28–30
Statistical Science for Management	January 29–31

COMMUNICATIONS AND OFFICE SKILLS TRAINING INSTITUTE

Office Management	January 7–9
Career Women Seminar	January 14–16
Interpersonal Relations for Nurses	January 14–16
Workshop in Better English	January 14–17
Conference Leadership	January 15–17
Accelerated Reading	January 20–24
Secretarial Decision Making and Problem Solving	January 21–23
Interpersonal Communications for Managers	January 28–30
Seminar for Legal Secretaries and Assistants	February 25–27
Secretarial Techniques	March 25–27

Contact the Training and Special Programs Branch for applications and further information, extension 5622, Mail Stop 241-4.

WANT ADS

Transportation

'59 Sunbeam Convt., original owner, excel. mech. condition, recent overhaul, classic at $750/offer. Alan Faye (408)867-2866.

'71 Volkswagen Fastback, 4-speed, radials, new shocks, AM-FM radio, 25-30 MPG. Super low total mileage, super condition, $2000. 257-6574 after 5:30 p.m.

'64 Cadillac Convertible (a rare opportunity to own a reliable, restorable classic for only $225.00). Call George at 343-9730.

'72 Pinto, 2-door, 30+ MPG, 4-speed, good condition, $1500.00. Call 493-5300 before 5:00 p.m. Ask for Carl.

'64 TR-4 – new top & paint, wire wheels, body & engine good, $1100. Call Pat after 5:00 p.m., 996-1246.

Miscellaneous

Kitchen stove, Signature. 30" Coppertone. Natural or butane gas. Top and oven lights. Appliance plug. Clock and timer. Broiler. Oven comes apart for cleaning and doors can be removed. Clean. $95. Call (408)243-2497.

Heavy duty bench grinder. Two grinding wheels. Sealed ball-bearings. Two eye-shields, two tool rests. On-off switch. Parts list. Nearly new. $110 (cost $185). ¾-HP motor. Call (408)243-2497.

5.60-15 (165-15) tires, used but plenty of tread left. Perfect for VW's. $15.00 for the pair. 257-6574 after 5:30 p.m.

FOR SALE – need an interesting gift – sterling silver rings handcrafted, each unique and different. Prices vary according to design of ring. Call P. Burgess at 275-8754 eves.

Dinette table and 6 chairs. Green with touches of orange. Like new $100.00. Marianne, 969-9742 after 5 p.m.

IBM electric typewriter – about 20 yrs. old, factory rebuilt, like new. Will sacrifice for $120. Call 946-0349 after 5 p.m.

Bell & Gossett motor compressor unit, piston type oil-less air compressor, ¼-HP motor, displacement 1.9 CFM at 1725 RPM, up to 75 psig continuous operating pressure–90 psig intermittent, automatic centrifugal pressure & moisture unloader-check valve, ideal for airbrush, bike tires, etc., excellent condition, $60, call 379-4305.

Fisher "M-Scope" metal detector vacuum tube model, good condition, $50, call 379-4305.

Never-mar coffee table w/record turntable, $20; 4x6 orange drapes, $15; traverse rod, $5; 4x3½ walnut Formica table plus leaf & 6 aqua naug. chairs, $85. All in excellent condition. 263-1636 after 5.

Have shelled walnuts available. Will deliver to Ames. $1.50/lb. Please call Irene Tharpe (408)779-3022.

Cartrivision tapes. Large cartridge size, with 15 to 20 min. of Video Tape $3 ea. or with 60 min. of Video Tape, $10 ea. Robert Walker, ext. 6563.

Tennis Racket, aluminum, Salazenger Meteor, 4½ L, used 2 hours. List $27, will sell for $12. 964-9808.

Found: A pocket knife near Bldg. 227. Please claim if it is yours by calling Putnam at ext. 6539.

LOST: 2 pairs of female slacks size 9/10. 1 pair brown, beige plaid; 2nd pair red, grey plaid. Both with cuff legs and high waisted band. If found, please contact Cheryl Branch at ext. 6326.

I'm interested in sharing in a car pool from the Granada Condominium area (Milpitas) to ARC (Bldg. 239) either 7:30 to 4:00 or 8:00 to 4:30, 946-0606.

One loving Siamese cat, spayed, seeks home far away from 2 dobermans, with which she currently lives in constant fear. Please call (415)464-0855.