

# the astrogram

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APRIL 1, 1971

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

## Method Found to Detect Oil Slicks

Means for detecting and determining the size of oil slicks via sensing devices carried on aircraft and later, it appears, by satellite, have been developed by research at Ames.

The measurements were made off the West Coast in the Pacific Ocean from a twin-engine Cessna 401 light aircraft during 60 hours of tests over controlled oil spills. The aircraft's sensors detected slicks resulting from both heavy and light crude oils and light diesel oil.

It is often impossible to see oil slicks on the ocean from aircraft, so it is important to have sensors that can spot them. Researchers John P. Millard and John C. Arvesen, both of Ames, say the approach should be applicable to a satellite-borne system.

With such a system in operation from polar-orbiting satellites, oil slicks could be spotted and tracked on a global basis every few days, except in those areas where persistent cloud cover would prevent immediate detection from a satellite.

The sensors measure sunlight (sky light on cloudy days) as it is

reflected from the surface of the sea. The researchers found via an airborne radiometer that spilled oil stood out starkly from ordinary ocean water in the near ultraviolet at wavelengths of about 3,800 Angstroms and in near red light at about 6,000 Angstroms. Polarization measured from the reflected light of the oil spill also showed sharp contrast.

Not only can the researchers distinguish between light and heavy oils in any one slick (the light oils appear brighter) but also they expect to be able to determine the volume by repeated observations. Knowing the type and quantity of oil would be important in finding the source.

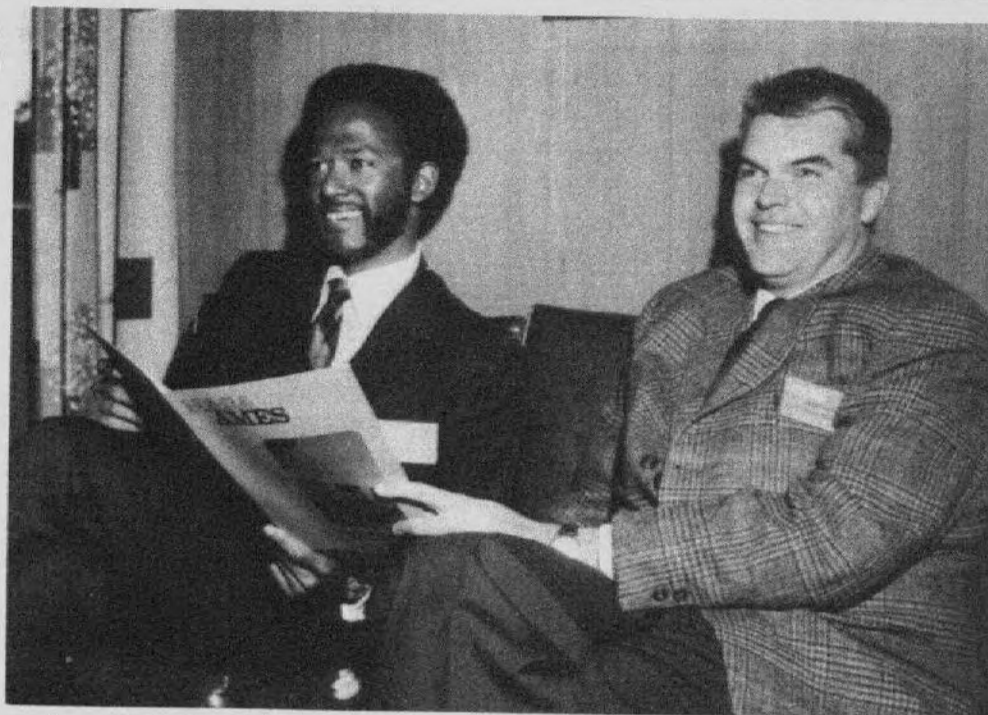
The tests were conducted as part of an Ames remote sensing program designed to detect water pollution and biological activity, i.e., plankton or other small sea life.

Ames participated in a controlled oil spill program sponsored by the U.S. Coast Guard. The slicks consisted of 330 gallons each of light, medium and heavy crude oil and refined diesel oil.



JAMES P. CONNOLLY . . . Research Instrumentation Branch engineer, is pictured as he signed 500 admission tickets for the "Toussaint Show." Mr. Connolly was instrumental in arranging for the performance which will take place Saturday, April 3 in the Ames Auditorium. "The Great Toussaint", star of stage and television in the United States and Canada, will present supernatural illusionary effects of enchanting sorcery and conjecture.

Mr. Connolly brought the idea of a "Toussaint Show" to the attention of the ARA Executive Board, and made all necessary arrangements, from security and parking to the auditorium and tickets, for the show. Mr. Connolly is an experienced coordinator of public projects; he spent two years, 1964 to 1966, with the Peace Corps in East Africa building roads.



EEO CONFERENCE SPEAKER . . . Ira Hall (left), Director of the Stanford Mid-Peninsula Urban Coalition, met with Dr. Hans Mark (right), Ames Director, at the Center's conference on management's role in the equal employment opportunity program held last week. During his talk Mr. Hall urged the audience to help plan goals and programs for hiring minority workers at all levels -- and then to carry out their plans. Other speakers for the three-day conference included Dr. Carlton Goodlett, publisher of the Sun-Reporter, San Francisco; Dr. Mary Hayden, California State College at Fullerton; Monico Amador, Compliance Officer, Department of Housing and Urban Development, and Nat Brown of the U.S. Civil Service Commission, San Francisco. The seminar brought together management officials, personnel directors, EEO representatives and Federal Women's Program Coordinators from government agencies throughout the San Francisco Bay area.

## Textbook Published

A textbook covering virtually all semiconductor devices has been written and published by Ames research engineers Gordon J. Debo and Clifford N. Burrous of the Electronic Research Branch.

Entitled "Integrated Circuits and Semiconductor Devices: Theory and Application", the book offers a comprehensive but concise introduction to solid-state devices and is aimed at junior college, engineering technology, and industrial training students, as well as practicing engineering technicians. Course prerequisites include semiconductor physics, basic circuit analysis and an introduction to transistors.

The text material is divided into five sections and discusses the characteristics and theory of operation of each device, showing, too, how the device can be applied in practice. Two appendices on bipolar semiconductor theory complete the book.

As practicing engineers at the

## Ames Hangar Apron Area Off Limits

All Ames employees are requested to stay clear of the apron area of the Ames Hangar (Bldg. N 211). Due to taxiing jet and prop aircraft and the landings and take-offs of helicopters with high speed rotors, it is extremely dangerous for personnel, including joggers, to cross this area. Their presence, anywhere on the apron, poses an additional hazard for the pilot who may endanger his aircraft to avoid personnel.

Permission to cross or view aircraft from this apron area is, at all times, permanently withdrawn.

Center, the authors are involved with the day-to-day problems of designing electronic circuits employing the whole range of semiconductor devices. They have up-blished and granted on various circuit techniques. Both authors have taught in evening schools, industry and junior colleges.



# Contractor E.E.O. Program Office

A Contractor Equal Employment Opportunity Program Office was established here recently. Joseph M. Camp, Chief Contractor Relations Officer, will coordinate the program with the assistance of Contract Compliance Specialists, Marcial Simpson and Calvin Fenrick. The new office assumes responsibility for program coordination at Ames and Flight Research Center, Edwards, California. Previously the program, which was established in 1964, has been coordinated through Washington, D.C.

The primary function of the Ames office is to assure the establishment of equal employment opportunity compliance programs for on-site support service contractors and their employees.

Recently the office successfully conducted its first Contract Compliance Review at the Center. The review is one of the many functions by which the Ames team will analyze and evaluate contractor's problems in relation to equal employment practices. They will also investigate contractor employee complaints of alleged discrimination of noncompliance within the provisions of the EEO contract requirements and counsel contractor employees with problems and complaints of discriminatory practices. When necessary, agreement will be reached through conference, conciliation and mediation.



NEW EEO PROGRAM OFFICE . . . established at Ames recently under the guidance of Joseph M. Camp (center), Chief Contractor Relations Officer and Contract Compliance Specialists, Marcial Simpson (left) and Calvin Fenrick (right). The new office, called the Contractor Equal Employment Opportunity Program Office, will assist contractors and their employees establish and maintain equal employment practices.

# Apollo Technology for Aircraft Control

NASA will soon begin flight research to demonstrate that aircraft of the future can be flown by an electronic control system like that used in the Apollo spacecraft.

Today's aircraft use a complicated and heavy, mechanical system of metal rods, hinges, and hydraulic lines to carry the pilot's signals from the control stick in the cockpit to the aerodynamic controls on the wings and tail.

The accepted theory has been that these mechanical systems give the utmost in reliability, but this theory has been challenged recently because of battle damage in the case of military aircraft and structural bending in the case of commercial aircraft.

## ELECTRONIC SYSTEM

An electronic system gets around these problems by substituting lightweight wires for push-rods and then adding several redundant wire-paths at different locations in the aircraft to make the overall system less vulnerable to damage. This type of control is usually referred to as the "fly-by-wire" method.

NASA engineers and scientists at Flight Research Center, and Manned Spacecraft Center, have teamed up to adapt the Apollo Moon flight hardware to reliable "fly-by-wire" control system for the aircraft of tomorrow.



BEST NEWSLETTER AWARD . . . for reporting the United Fund story during the 1970 Campaign was presented recently to "The Astrogram" at an awards dinner hosted by Arcada Graphics in San Jose. Mrs. Dorothy M. Evans (left), editor of the Ames publication, accepted the award from United Fund President James B. Wiesler, regional vice president for Bank of America. Miss Jeanne Richardson, editorial assistant in The Astrogram Office, admires the plaque which is a replica of the award-winning newsletter. Miss Richardson was responsible for the Combined Federal Campaign issues of The Astrogram last year and visited United Fund agencies in the area to learn of their work for pictures and articles.

# The Astrogram Wins United Fund Award

The Best Newsletter Award for reporting the United Fund story in 1970 was presented recently to "The Astrogram" staff as part of the UF's Silver Cup Competition among industrial press editors. Mrs. Dorothy M. Evans, editor of the Ames publication, accepted the award plaque from James B. Wiesler, president of the Santa Clara County United Fund and regional vice president for Bank of America.

Awards were presented at a dinner meeting of the Bay Area Society of Industrial Communicators (BASIC) hosted by Arcada Graphics of San Jose. President Wiesler acknowledged the work of the industrial editors and their contributions to the UF effort, and thanked them for their continued support.

In addition to the The Astrogram award, winners in the contest included: Best Magazine, Gary Williams, editor, Memorex Intercom; and Best Tabloid Newspaper, Bob Bell, editor, Nuclear Energy News, General Electric.

Bob Bell also received the silver cup perpetual trophy, "The United Fund Industrial Press Award," for the best all-around coverage of UF during the campaign. This award was presented to "The Astrogram" in 1965, the first year of the competition.

# Foster Homes Needed Soon

Foster homes are needed for several children now in the residential treatment program of Eastfield Children's Center for emotionally handicapped children.

Ages of the boys and girls range from 8 to 13 years. At Eastfield they have been receiving special care from trained personnel and now are able to cope with the pressures of life.

Those for whom foster homes are required either have no families or their families are unable to care for them. Eastfield foster homes receive the same board rates as Santa Clara County Department of Social Services foster homes, and members of the Eastfield professional staff are on hand to work with foster parents.

Persons who are interested may write to Eastfield Children's Center, 251 Llewellyn Ave., Campbell, or call 379-3790 from 8:30 a.m. until 5 p.m. Monday through Friday.

<b>THE ASTROGRAM</b>	Room 134 Admin. Mgt. Building Phone 2385
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Editor . . . . . Dot Evans Reporters . . . . . NASA Employees	
Deadline for contributions: Thursday between publication dates	



# Anemometer for Low-Speed Winds

Anemometers - the whirling cups at weather stations and airports - in most cases are the instruments of choice to measure wind speed.

NASA found such wind gauges were not very efficient in measuring wind speeds below 10 miles an hour, and were of limited use when applied to measuring air speeds of vertical and short take-off and landing (V/STOL) aircraft.

## DRAWBACKS

Anemometers have several other drawbacks: the moving parts rust and freeze and inertia makes them sluggish during sudden changes of wind speed.

A supersensitive device developed primarily for V/STOL aircraft by NASA overcomes most of these failings. It will measure winds as gentle as one-tenth of a mile per hour. It has no moving parts, and therefore cannot clog with rust or snow or ice. Birds can perch on it without affecting its operation.

Two of the new devices can be mounted at right angles to measure velocity and direction of the wind in one plane. With a third mounted vertical to the plane, the combination will measure the wind velocity and direction in all directions.

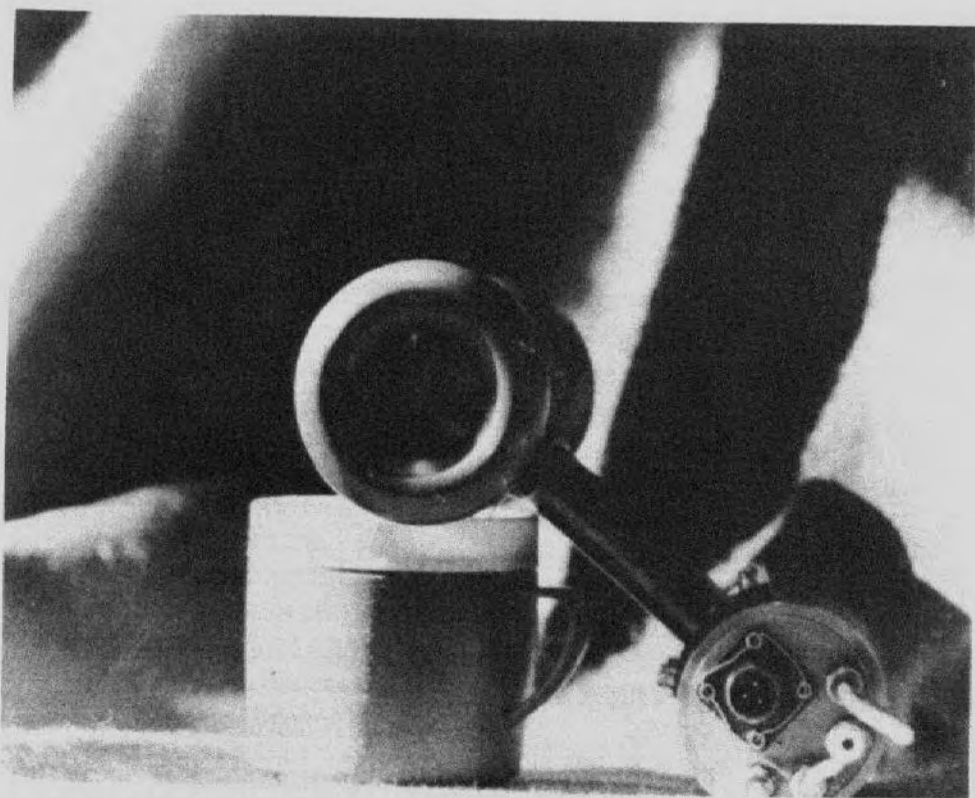
Two jets of air, under equal pressure flow from nozzles at the opposite ends of a short tube. The air travels from each nozzle across brief open gaps to be received by tubing that is perfectly in line with the flow from the nozzles. The

whole assembly is mounted inside and along the axis of a larger tube that straightens the flow of wind to be measured and directs that flow parallel to the air flows going from each nozzle to each receiver tube.

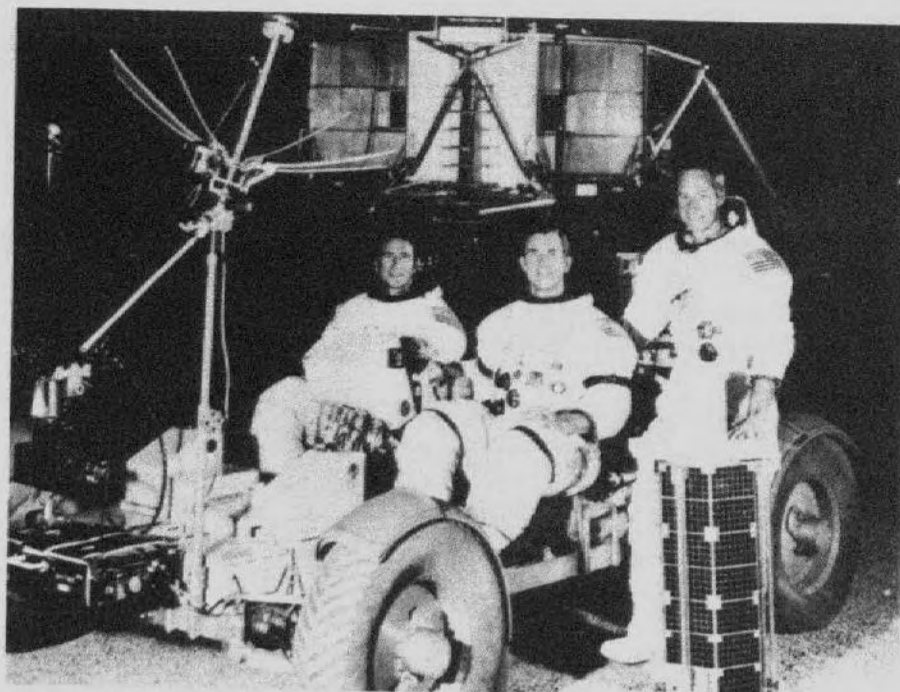
Without any wind introduced for measurement, the receiving tubes relay equal pressure to a simple pressure gauge. The gauge, shows zero because there is no difference in pressure from either receiving tube.

However, when wind velocity is present, there is a mixing of air flows. The air from one nozzle mixes and flows against the wind and the air from the other mixes and flows with the wind. This causes a difference in the pressure at the two receiver tubes. This difference is detected by the differential pressure gauge which responds by moving its needle to a reading that shows the pressure difference. The gauge is calibrated in such a way as to show the air velocity.

The sensor could also be used effectively in coal mines to measure the low speed movements of ventilation air. Such measurements are needed to calculate the volume of fresh air directed to the coal "face" areas of underground mines, where adequate ventilation is required to dilute and carry away explosive gas and to control harmful dust. The Bureau of Mines has shown interest in the sensor.



**LOW-WIND SENSOR . . .** This device, resting on a coffee cup, was developed by NASA to measure wind movements as faint as one-tenth of a foot per second. Light-weight and simple to operate, it has no moving parts and thus fewer errors (created by friction, inertia, or roosting birds) than conventional anemometers, or wind gauges.



**APOLLO 15 ASTRONAUTS** James Irwin, David Scott and Alfred Worden display the Lunar Rover and the sub-satellite. The battery-powered Lunar Rover is equipped with a television camera which will be used when the vehicle is parked, and it can be controlled from the ground while Astronauts Scott and Irwin explore the Moon. The sub-satellite is a small satellite that will be ejected from the Service Module early in the mission and remain in lunar orbit after the astronauts return to Earth. It will contain particle detectors and a magnetometer, thus providing data to correlate with the surface magnetometer and particle detectors and a S-band transponder.

## VACANCY NOTICE

### Merit Promotion

#### TECHNICAL ASSISTANT

Technical Assistant, GS-1301.1 - 11/14. Space Shuttle Office, Astronautics Directorate. Closing date is April 19, 1971.

How to Apply: Interested persons should telephone the Employment Branch, ext. 2021, or send a memorandum to Mail Stop 241-6 by the closing date.

## "Thank You" Note

"I was truly overwhelmed by so many people who honored me at my retirement luncheon, and all the good wishes by those who could not attend. I shall always have a deep feeling of pride to have known and worked with all of you.

Many thanks again for the wonderful gifts. They are most appreciated.

My wife and I shall make good use of the beautiful luggage on our trip to Ireland and other countries of Europe.

Victor C. Bayard "



**Ames Theatre Offer**

## "LITTLE BIG MAN"

STARRING **DUSTIN HOFFMAN and FAYE DUNAWAY**

GROUP SALES MAIL ORDER

NASA-AMES RESEARCH CENTER

Make checks or money order payable to CENTURY THEATRES and mail to SPECIAL EVENTS, 3164 Olsen Drive, San Jose, Calif. 95117.

Please send me \_\_\_\_\_ tickets at \$ 2.40

Date Sun. Apr 25 Time of performance 8 p.m.

My check for \_\_\_\_\_ is enclosed.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Please enclose remittance and a stamped self-addressed envelope. **ALL TICKET REQUESTS MUST REACH THEATRE SEVEN DAYS PRIOR TO SHOW DATE**, and tickets will be mailed soon after.

NOTE DEADLINE DATE FOR SUBMISSION OF COUPON



# Ames Airings

... by Jeanne Richardson

GENIE DE GABAIN, Simulation Experiments, and her husband Ron went skiing recently. Tired of the same old slopes, they took off for whiter mountains and skied Austria. They reported, for those who are planning to ski Austria this month, that the weather is warm (in the 40's) and the skiing is perfect.

They stayed in a quaint little hotel on a private land resort in Hinterthal, that's a few kilometers from Salzburg. The hotel is a converted 16th century farm house, with a capacity of around 30 guests. Not the Holiday Inn, but quaint.

They spent a couple of their nine days in Austria shopping in Salzburg. They said it's beautiful there, with a castle, watch houses, narrow streets and a flower box in every window.

GLEN GOODWIN, Director of Astronautics, returned recently from a lazy visit to the west side of the big island of Hawaii. A veteran visitor of the islands, Glen spent most of his time at the Mauna Kea, just sunbathing, playing golf, swimming and quenching his Hawaiian thirst.

## CONGRATULATIONS

DEAN JAYNES, Measurement Sciences and his wife JOAN, General Procurement, became the happy parents of Deanna Michelle, March 31, at 2 a.m. in Kaiser hospital. Baby Jaynes weighed 6 lbs., 7 1/2 oz. and is a first for Dean and Joan.

DR. DAVID FELLER, Assistant Chief, Environmental Biology became a grandfather March 30. In Frankfurt, Germany, at 6 a.m., his daughter, Barbi Druliner gave birth to Rachel Beth. She is the first child for the Lt. and Mrs. Druliner and the first grandchild for the Fellers.

The Feller family will be spending a month in Europe this summer, visiting their new granddaughter and sightseeing.

## NACA Tech Reports

The Ames Library has had an urgent request for a set of the old NACA Technical Reports in bound volumes. The Library has been unable to locate the books and would appreciate assistance in finding a set. Any Ames employee with knowledge of an available set of the Reports is asked to please contact the Library at extension 3312.



BASKETBALL TROPHY . . . contributed to the Ames trophy case by Ames team manager Emmett Lampkin (right), Human Performance Branch, on behalf of the Ames second place Industrial League basketball team. Accepting the trophy is Jan Konrath (left), Data Management Analysis, and ARA president. The team finished the season with the Mountain View Recreation League championship playoffs. Despite the second place standing, the team was the best all-around team to represent Ames in the past seven years, according to team manager, Emmet Lampkin. The team's overall record for the season was 10 wins, 4 losses, including a one-point post tournament loss. Members of the team were: Dave Peterson, Thermal Protection; Herb Finger, Research Instrumentation; Paul Kutler, Computational Fluid Dynamics; Bruce Ganzler; Simulation Experiments; Bob Holmes, Research Facilities Engineering; and Contract employees Gary Black, Ron Whelan, Tom Larson, Rubin Martel, Tom Sacco and Bob Deisher.

## New Optional Car Accident Insurance

Certain commercial car rental companies have revised their agreement form to include optional insurance, that is "Accident Insurance \$15,000 with Medical," in addition to "Collision Damage Waiver."

The cost of the optional accident insurance is not reimbursable; such insurance is comparable to accident insurance purchased by the traveler when traveling via airplane. Personnel desiring this insurance are requested to make separate arrangements for the payment of the insurance coverage and not charge the \$1 per day premium to NASA.

The "Collision Damage Waiver" insurance continues to be a mandatory item of coverage for NASA personnel utilizing commercially rented vehicles.

All personnel utilizing commercial rental vehicles are requested to please use due care when accomplishing the vehicle rental agreements.

## Special Discounts Offered to Personnel at Ames

### NEW ITEMS:

ALL ABOARD! CLUB . . . 1971-1972 Membership Cards are now available in "The Astrogram" office for special rates on the Roaring Camp and Big Trees Narrow-Gauge Railroad, plus a reduction on accommodations at the Holiday Inn of Santa Cruz.

Vito D'Aloia's Outdoor Sportsman Equipment Shop, 2289 Kenwood Avenue in San Jose is offering a special discount to Ames employees. Mr. D'Aloia is featuring Adidas tennis shoes, along with Hallet-Rodlaer Monte Carlo, "Lady." For information call 296-3982.

## History of Ames

A limited number of a paperback edition of the "History of Ames" by Edwin P. Hartman has been obtained and will be offered for sale to Ames and contractor employees at the Center. Price of the edition is \$4 and may be purchased from "The Astrogram" Office, Room 134, Admin. Mgt. Bldg.

# WANT ADS

The Astrogram's ad section is provided as a personal, non-commercial service to Ames employees. Advertiser must be identified by name, extension and organization. The name may be left out of the ad but is needed for records. Ads must be submitted in legible writing to The Astrogram, N-241-4, by Thursday, a week before publication. The advertiser's home telephone number must be provided as a point of contact except in carpool notices.

### AUTOMOBILES

For Sale-68 Valiant-2-door, standard transmission, 145 hp, 6 cyl., 55,000 miles. \$1100. 245-6924.

For Sale-60 Rambler, 4 new w.w. tires, new brakes new paint job, good condition, clean. Call Jim at 967-7672, price \$250.

For Sale-Pick-up, 60 Chev. 238-V8, long bed harden bumper, western mirrors, radio, three new tires, \$475, Brooks 356-9695.

For Sale-1965 T-Bird, Landau, full power, air conditioning, \$850. Call 365-0578.

For Sale-1963 Sunbeam Alpine, conv. sports car, new top, and Tauna cover, new tires and runs good. Call 296-2731 after 5 p.m.

For Sale-1964 Comet Conv. new top, rebuilt engine new tires, new brakes. Immaculate condition. Must sell. \$550 or B.O., 969-1494.

For Sale-1968 Datsun, PL-510 service manual \$6.50, call 243-8963.

For Sale-1964 Chevrolet Impala super sport hard-top, 2-door, new pts, plugs and good tires all around. General condition is good, \$300 or best offer. Call 854-3145

For Rent-Tahoe City cottage near lake and private beach area. Sleeps 6. Spring rate \$70/wk or \$30/wknd. Call 328-4642.

### HOUSING

For Rent-Cabin in the Donner Pass area. Warm, cheerful, well equipped. All electric heat, near Soda Springs, Sugar Bowl, Boreal Ridge and Donner Ski Areas. Excellent location for cross country skiing, snow play, spring skiing, etc. Leo Poppoff, 323-2375.

For Sale-Condominium 4-bedroom, 2 1/2 bath, Eichler townhouse, pool, play areas. Best Santa Clara loc. cul de sac, adjacent to elem. school, park. \$29,500. Will consider trade on larger house, or short term lease back from investor. Call 248-4690.

Car Pool-I would like to join or form a car pool from the Santa Cruz Mountains area (esp. Felton/Scotts Valley). Please call Jim on ext. 2032 or at home 335-7349.

### MISCELLANEOUS

Free-Kittens, free to a good home. Will be 6-weeks old April 8, great for Easter baskets, grey tabbies, smokie greys, black with white trim. Call 257-4110.

For Sale-Baby bed and mattress 6-year crib, white. \$20. Call 732-3905 after 5 p.m.

For Sale-Dining Table, modern walnut, 4-chairs, buffet. Good condition. 252-8304.

For Sale-Brought back too much from Europe. Antique brass inkwell stand, \$35. Other items, 493-1638.

For Sale-1967 Camper Special, V-8, 1/2 ton Ford Pick-up automatic, P.S., P.B., air. With Siesta 8 1/2 foot telescopic camper. Jacks, both excellent cond. call 292-5028.

For Sale-14-foot Ski Boat, HP, electric start, just tuned, trailer, excellent cond. \$550, call 253-7945.

For Sale-Bedroom set complete with double bed, mattress, box spring, dresser with mirror, chest of drawers. Good cond. All for \$100, call 266-4513.

For Sale-13 foot Aguacat catamaran and trailer, \$795. 1969 Yamaha 250 Scrambler \$449. Call 969-2685.

For Sale-Electric guitar with amplifier \$35 never used; Holiday Movie Camera and projector, make offer. Singer sewing machine with cabinet plus attachments and button hole maker attachment \$50. or best offer. Call after 6 p.m., 226-3413.

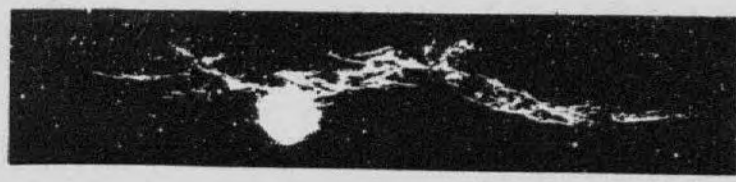
Wanted-Betty Crocker coupons to purchase Kidney machine. Deadline has been extended to December. If you have coupons which you would like to donate send them to Marilyn Garis, mail stop 241-8.

Wanted-Non-smoker to share driving on 8-4:30 shift, from vicinity of Johnson Ave. and Bollinger Rd. call Pearson, call 2063.

For Sale-Electric Range (Frigidaire), with double oven. In good working order. \$40. Call 736-1475, after 5 p.m.

For Sale-Dishwasher, Westinghouse, in good working order call 736-1475 after 5 p.m.





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

## Ames Adds Two New Diagnostic Tool For Heart Disease Detection Research Aircraft

Ames is expanding its Airborne Research Program and has acquired two additional aircraft.

The planes, Lockheed U-2's are capable of sustained flight at very high altitudes and will provide ideal platforms for remote sensing of large areas. For example, a single photograph from high altitude can encompass 500 square miles of the Earth's surface.

Objectives of the program are; to simulate over four ecological test areas in the United States as closely as possible the data output of the Earth Resources Technology Satellite (ERTS) scheduled for launch in 1972; collect data over various test sites simultaneously with passes of the ERTS satellites and Skylab after they are orbited; support Earth resources survey programs of other agencies; and to conduct observations in astronomy, atmospheric physics and geophysics for NASA's Physics and Astronomy programs.

When the aircraft become available to the experimental program this summer, they will make repetitive flights over the test sites at an altitude of about 68,000 feet. To simulate the coverage provided by the ERTS satellites, each site will be photographed every 18 days at the same local time.

The test sites are: Arizona, including Phoenix and Tucson; arid lands. Two California sites, Feather River and San Francisco/Los Angeles: hydrology and agriculture. Chesapeake Bay: ecology and oceanography.

Cameras to be flown by the aircraft will gather data to approximate the scale and spectral information from two ERTS instruments, the Return Beam Vidicon (RBV) and the Multispectral Scanner (MSS).

The two U-2 aircraft complement three other planes stationed at the Manned Spacecraft Center in NASA's Earth Resources aircraft program.

The U-2's will also be used to carry out experiments in astronomy, atmospheric physics, and geophysics. The planes will be able to fly above most of the Earth's atmosphere, carrying telescopes and

(Continued on Page 2)

Doctors can watch a movie of the beating of a patient's diseased heart - identifying dead spots or scar tissue in the heart wall, aneurysms (bubble-like projections of the heart muscle), and other malfunctions - with a computer method devised by an Ames-Stanford University team.

The system was originated by Ames' Dr. Harold Sandler, Chief of the Biomedical Research Branch, and the clinical work on the project is being done under the direction of Dr. Donald C. Harrison, Chief of the Division of Medical Cardiology at Stanford Medical Center. Daryl Rasmussen, Ames research engineer, developed the mathematical and computer techniques, using data gathered by Dr. Sandler during six years of work at Ames on heart chamber dimensions and means of measuring them.

### DEVELOPMENT

The system, which is still under development, would improve on current complex diagnostic methods by providing a simple means of viewing the heart in action. Figuratively, it allows doctors to "walk around" the isolated beating heart, viewing it from any desired angle. They also can stop the heart at any desired point of expansion or contraction and can play the picture back and forth for many cycles.

The system projects a three-dimensional animated cartoon-like image of any desired chamber of the patient's heart, in lines of light on a computer display screen, similar to a television screen. The animated display is derived from two-dimensional "x-ray movies" made by injecting x-ray contrast dye into the desired heart chamber.

It appears that the method may be a major advance for the physician to determine the patient's need for heart surgery, coronary artery grafts, and treatment of various heart conditions. Heart disease is the leading cause of death in the United States.

### ANIMATED DISPLAY

The system's animated display is exact enough to show dead sections of the heart wall about the size of a nickel (two centimeters), details of large malfunctions, and holes be-



NEW DIAGNOSTIC TOOL FOR HEART DISEASE . . . Scientists and doctors from Ames and Stanford University Medical Center in Palo Alto have a new system under development which appears to be a major advance in diagnosis of heart disease. The system employs a computer which is programmed by a two-dimensional X-ray movie of the patient's heart chamber and in turn generates a three-dimensional animated display. Doctors will use the system as a diagnostic tool to study the heart as it beats identifying dead spots in the heart wall, stretched heart muscle and other malfunctions.

Ames scientists Dr. Harold Sandler (left) and Daryl Rasmussen discuss one of the animated three-dimensional computer displays. The display shows the left ventricle (main pump) of a patient's diseased heart as it beats. Dr. Sandler initially devised the system, and Mr. Rasmussen developed the computer logic. With the system, doctors will be able to stop and start the heart, look at it from various angles, run it in slow motion and make other studies.

tween heart chambers. Combined with standard clinical measurements of blood-flow per heart beat, it can measure inefficient pumping by heart chambers. It will also help to identify leaky valves and shows the severity of valve damage.

This system will allow further validation of a sonar-like system for testing heart function which is also under development by this group of scientists. The sonar system would allow examination of the healthy hearts of astronauts, pilots and ordinary citizens, using a simple sensor placed on the chest.

The value of the method for doctors is that it eliminates all irrelevant details. For example, it can show the complete interior surface of the beating left ventricle (the heart's main pump) on the lighted display screen and nothing else. The system can do the same with

(Continued on Page 3)

## Retirement Seminar at Ames

A Retirement Seminar for employees who are considering retirement will be held at Ames on May 11. The time and place will be announced to attendees on an individual basis at a later date.

The one day program will include talks by guest speakers who will discuss a variety of subjects which are expected to be of special interest to those contemplating retirement. The program will include such topics as:

- Federal Retirement Benefits
- Social Security Benefits
- Financial Planning
- Leisure Time
- Housing
- Part-time Employment

Interested personnel may submit their name to the Training Office, ext. 2033, no later than May 1.



## NASA - German Cloud Experiment

The German Federal Ministry for Scientific Research (BMBW) and NASA are cooperating in an experiment aimed at ejecting into space a chemical which will produce a glowing, barium ion cloud about 20,000 miles above the Earth.

If successfully launched the cloud will be visible to the naked eye for 15 to 20 minutes after release of the barium as a first-magnitude or bright star over most of the Western Hemisphere the night of April 20.

A Scout rocket furnished by NASA is scheduled to lift off from Wallops Island Virginia, between 7 and 9 p.m. EST and about three and one-half hours later the barium payload will be ejected 20,000 miles above Central America to form a very thin or widely-dispersed ionized cloud about 10,000 miles long which can only be detected by sensitive ground and airborne instruments.

Both German and U.S. scientists at observation sites in North and South America will use special camera equipment to view it. In addition, the Ames Convair 990 aircraft will observe the cloud on a flight corridor between Bermuda and the eastern United States. Weather conditions at the various sites must be clear, or expected to be clear, during the viewing time to permit the launch.

The purpose of the experiment is to study the behavior of a barium ion cloud at high altitudes. At lower altitudes, the cloud is moved by electric and magnetic fields and can be used to map them in much the same way as iron filings are used to map the magnetic field lines around a magnet. At higher altitudes it is believed that this can also be done if the cloud can be observed for long enough to "settle down" after the initial explosive release.

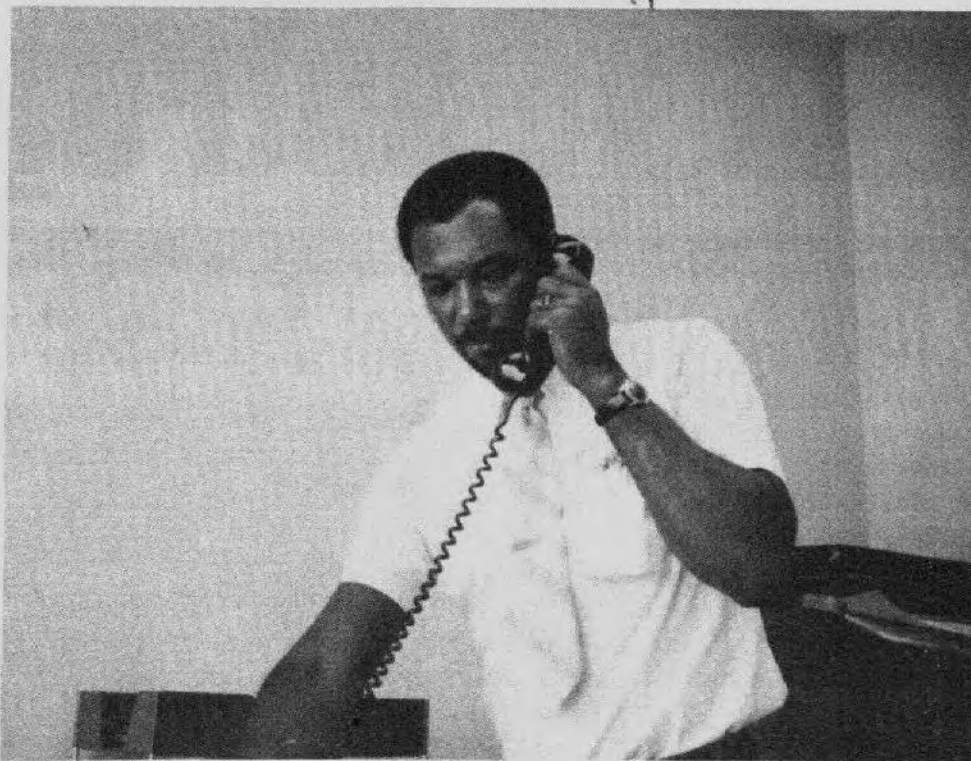
As the barium ions distribute themselves along a magnetic field line in a long visible cloud, photographs will permit visual mapping of the electromagnetic forces acting in the area in which the barium is released.

## Research Aircraft

(CONTINUED FROM PAGE 1)

instruments that can observe in the infrared, visible, and ultraviolet portions of the electromagnetic spectrum.

An "Announcement of Flight Opportunity" will be issued by NASA, inviting scientists to participate in the astronomy flight program.



WILLIE L. WHITE. . . recently appointed Ames Manpower Training and Counseling Specialist is meeting with Branch and Division Chiefs, and EEO Division Coordinators and is discussing the progress of Project Breakthrough. Mr. White, who was instrumental in its design, is presently coordinating the innovative program which proposes to make the fullest possible use of the skills of Ames employees. Project Breakthrough will be maintained as a continuing program in order to extend Equal Employment Opportunities on a continuing basis.

## Ames EEO Project Breakthrough Begun

A unique program, called Project Breakthrough, was begun at Ames recently. Through the project several employees are being selected for training that will increase their opportunities for promotion. Project Breakthrough was developed by the Equal Employment Opportunity (EEO) Committee as part of the Center's Affirmative Action Plan for EEO.

Willie L. White, Jr. of the Employee Development Branch was selected as Manpower Training and Counseling Specialist to coordinate Project Breakthrough. According to Mr. White; "The program is unique in that it does not focus on specific minority groups." Project Breakthrough was designed to provide opportunities for employees who are currently in a position which offers no promotion potential. While the program is for all such employees, it is specifically designed for those in grades GS-8 or WG-8 and below.

The methods used to evaluate and rank candidates will be consistent with methods defined in the NASA Merit Promotion Program. Employees will be rated on their experience, previous training, performance, and promotion potential. Maximum credit will be given for current performance and growth potential. The selecting official is the candidate's division chief.

The employees selected will be given the opportunity to participate

in training programs individually tailored to their interests and capabilities and consistent with possible future manpower requirements at Ames.

This training may consist of on-the-job training, on-site coursework or courses at local schools. The length of training will be determined by individual requirements. Such training will be supported and paid for by the Center to the maximum extent permitted under the Training Act.

## ARA Offers "This Island Earth"

"This Island Earth", a publication by NASA showing a collection of NASA's most spectacular photographs, can be ordered through the Ames Recreation Association until April 30. The price delivered to the Center is \$5 for the cloth-bound edition. GPO price is \$6.

The book contains 195 photographs, 162 in color including orbital views of the Earth's atmosphere, oceans, and land areas. The photographs are arranged to show the readers the Earth as it appears from space.

To insure delivery at the \$5 price checks must be mailed to ARA, Stop 233-2, no later than April 30.

## Withholding Tax

WILL YOUR WITHHOLDING TAX COVER YOUR 1971 INCOME TAX?

Due to changes in the withholding system made by the Tax Reform Act of 1969 (Public Law 91-172), it is possible that the tax being withheld from salaries of some employees is not sufficient to cover their federal income tax liability for the calendar year 1971. Employees in the following categories are most likely to need additional withholding:

- Each employee who expects to earn more than \$11,500 in 1971 and who expects to claim the \$1,500 standard deduction or itemize deductions totaling less than 13 percent of their salaries.
- Each single employee who expects to earn \$15,000 or more in 1971.
- Each married employee who expects to earn \$25,000 or more in 1971 whose spouse is not employed.
- All working couples.

Employees who are not sure that their present withholding will cover their 1971 income tax liability should estimate the amount of tax to be withheld for calendar year 1971 and compare this with the amount of their expected tax liability for 1971. Employees who find that they need more tax withheld should file a new exemption certificate (Form W-4) and claim fewer exemptions or ask for additional dollar amounts to be withheld. Exemption certificates (Form W-4) and the 1971 income tax tables and rates are available in the Fiscal Division, Payroll Office, Building 203, Room 120.

## Technicians Meet

The South Bay Section of the California Chapter of the American Society of Certified Engineering Technicians will meet on April 22, 7:30 p.m. at 20 W. Hedding Street, San Jose, in the old supervisors chambers.

All Certified Engineering Technicians and those interested in becoming certified are invited to attend.

For further information contact Don Gotimer, at work, 966-5002 or at home, 263-4867.

**The Astrogram** Room 134  
Admin. Mgt. Building  
Phone 2385

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Editor . . . . . Dot Evans  
Reporters . . . . . NASA Employees

Deadline for contributions:  
Thursday between publication dates



## New Heart Tool (CONTINUED FROM PAGE 1)

so the moving heart chamber can be seen from any point.

The computer program is based on studies of the exact proportions of hundreds of normal and abnormal human hearts gathered by Dr. Sandler from autopsies, and studies of patients with heart diseases of various types.

The two stored beats are repeated over and over by the computer, allowing doctors to study the heart in action for any desired period of time.

Doctors first take the x-ray movie, known as an angiogram. To do this, they inject a dye opaque to x-rays through a catheter into the patient's heart. The x-rays then outline the selected heart chamber in cross section as it expands and contracts.

Stanford cardiologists working under Dr. Harrison's direction take two sets of x-ray movies at right angles to each other, at 60 frames (pictures) per second.

Obtaining the x-rays may be difficult since injection of the angiographic dye itself changes the function of the heart and makes only the data from two heart beats acceptable for analysis. However, the researchers use a variety of independent measurements to make sure the two beats used are exactly typ-

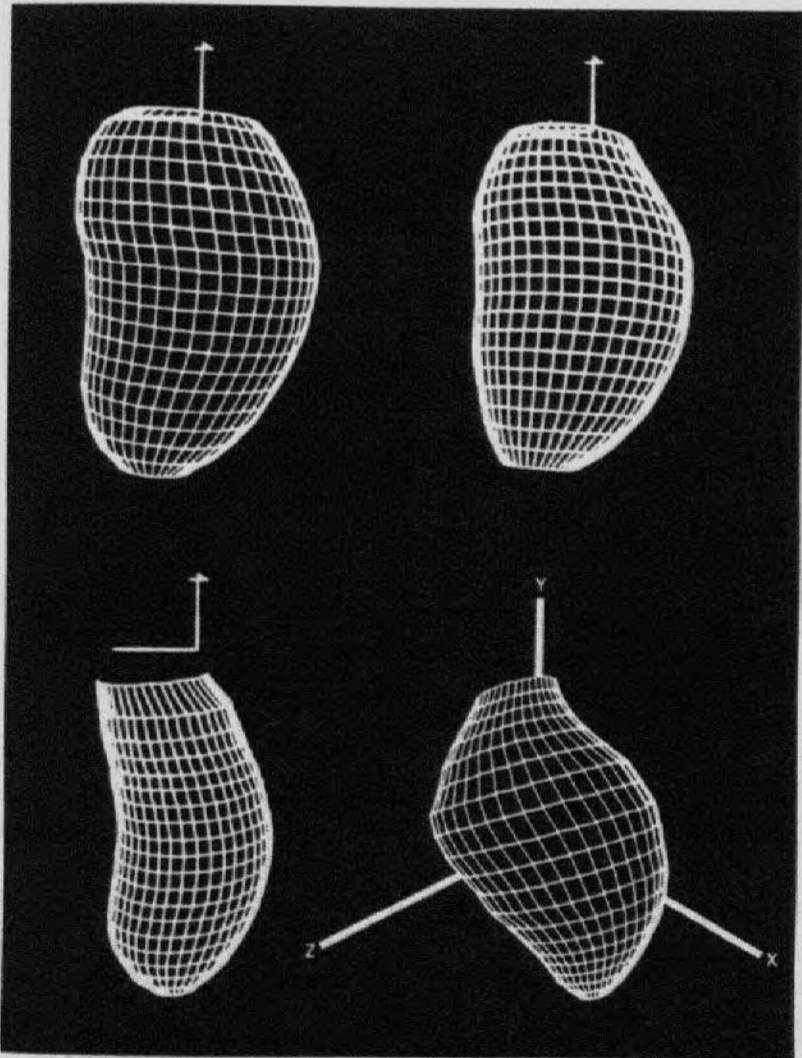
ical. Validation of the technique by other independent means is now being accomplished.

From the two x-ray movies, the computer constructs the animated display. The entire sequence of movie frames, each one containing the heart chamber outline, is traced on a computer input screen, and is retained in the computer memory. The computer program then mathematically projects the two views of the heart chamber back into space. From these it reconstructs the chamber. This three-dimensional construction is also stored in the computer memory for analysis and display.

The technique allows the computer to calculate the changing positions of the entire interior surface of the heart chamber in question, the right ventricle and the two auricles (intake pumps).

Since the animated displays are a form of computer readout, they can be transmitted to doctors at distant locations by an ordinary telephone line, and recreated on a computer display screen.

The displays are derived from x-ray movies, plus a computer program based on intensive research in heart configurations and dimensions, as well as new three-dimensional computer display techniques.



Excerpts from animated computer display, showing left ventricle (main pump) of patient's heart in various stages of contraction (top left, right, and bottom left). Bottom right is expanded left ventricle of another heart which has a plastic valve.



APOLLO 14 ASTRONAUTS VISIT AMES . . . The third team of astronauts to land on the Moon are pictured during their recent visit to Ames, at the controls of the Moving-Cab Transport Simulator. From left to right are Command Module Pilot Stuart A. Roosa, Lunar Module Pilot Edgar D. Mitchell, and Commander Alan B. Shepard. Gordon H. Hardy (far right), Ames Flight Operations Branch, briefed the trio on the operation of the simulator. The astronauts visited Ames while on a tour of California and met for an informal discussion with Dr. Hans Mark, Ames Director, members of his staff and the Ames Apollo experimenters.

## Open Season Change Civil Defense Alert Apr. 30

The 10-year-old policy of the U.S. Civil Service Commission to hold a health benefits "open season" at least once every 3 years is about to be changed to an open season once each year. The change in policy follows a recently completed 6-month study of alternatives to the current policy.

Under the new regulation, an "open season" will be held November 15-30, 1971, and November 15-30 of each year thereafter.

An employee who loses outside health insurance coverage when his (or her) spouse's private employment terminates will be able to enroll in the Federal program within a maximum of 1 year's time.

Also, employees or annuitants who move into a geographic area served by a group-practice or individual-practice plan for which they were not previously eligible will not have to wait as long as 3 years to take advantage of their newly acquired eligibility. Similarly, an employee who joins a union that sponsors a plan will be able to enroll in that plan within a maximum time of 1 year.

During the open season to be held in November, employees who are not enrolled will be able to enroll. Both employees and annuitants who are enrolled will be able to change from one plan or option to another and to change from a self-only to a family-type of enrollment.

Ames employees are advised by the Santa Clara County Office of Civil Defense that the next regular testing of the Civil Defense alert and warning system occurs at 11 a.m. on Friday, April 30.

## Special Discount Offered

The Calif. State Tennis Tournament, to be held at the Alpine Hills Tennis Club, Alpine Road, Portola Valley, April 26 through May 2, is offering Ames employees a special 50¢ discount on general admission tickets for the first five days of the tournament, April 26-30. An Ames ID badge must be shown when purchasing the special tickets which will cost \$1.50 Mon., Tues., Wed.; and \$2.50 Thurs. and Fri. The tournament will run from 11 a.m. to 6 p.m. daily.

## APOLLO 14 BOOK

A new NASA educational publication entitled, "Apollo 14 - Science at Fra Mauro", (NASA EP-91), is now on sale at the United States Government Printing Office, Washington, D.C. at \$1.25 per copy.

The 10,000-word booklet tells the story of the third manned lunar landing mission of Astronauts Alan B. Shepard, Jr., Edgar D. Mitchell and Stuart A. Roosa, Jan. 31-Feb. 9, 1971. Of its 58 photographs, 42 are in color and include many taken on the Fra Mauro landing site



# Ames Airings

... by Jeanne Richardson

RALPH B. (PAT) MALONE, Security Branch, and his son MIKE (student worker, Planetology Branch) decided to get away from the old egg coloring and bunny business, so they jumped in their Dunebuggy and headed for the Baja coast.

They were cruising past Ensenada, smiling as they thought of the coats, ties, and Easter baskets they had smoothly avoided, when the Dunebuggy stopped running.

## PROBLEM

After studying the problem for a while they found the difficulty and with the sympathetic help of a Mexican truck driver, the men were back on the road in no time. Again they cruised along with smug smiles. Again the buggy broke down. All told, before reaching Bahia de Los Angeles (point of destination) the boys met six very sympathetic Mexican truck drivers.

Not to be daunted in their Easter escape, they relaxed around Bahia de Los Angeles for a couple of days, then headed out for the gulf side of Baja.

They hadn't gone far before, you guessed it, the engine froze. Fortunately, the men were able to push the buggy back into the Bahia. Unfortunately, Mike displaced his knee while pushing.

The people in the Bahia were concerned about Mike's knee and suggested he pay a visit to their trusted witchdoctor, "Pallos Negros". Mike, although conscious of the generosity of the people, decided to wait and visit his own doctor.

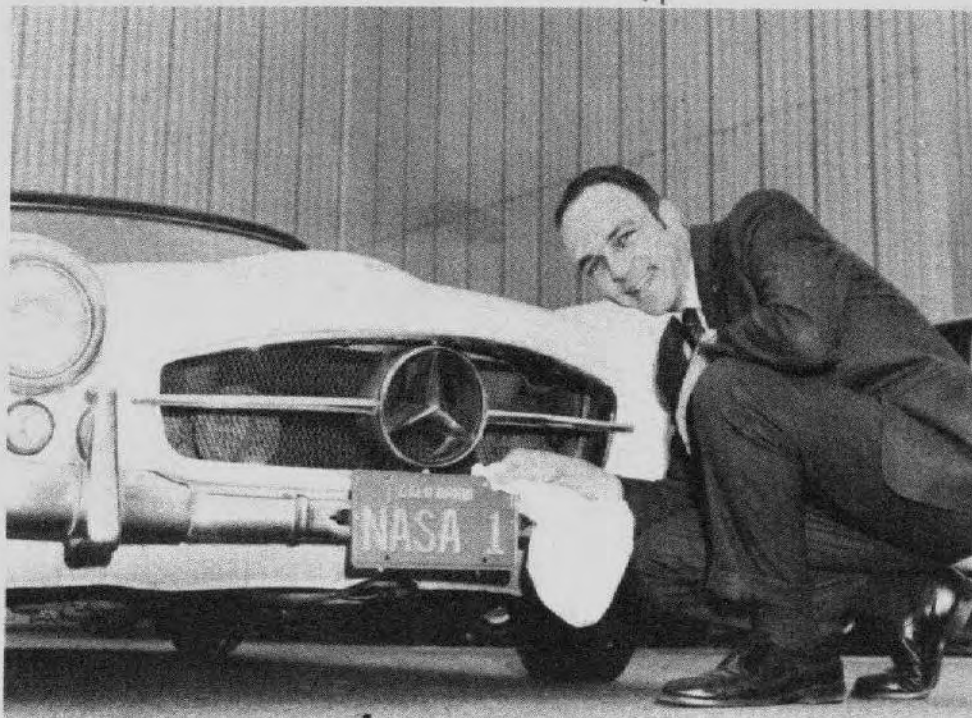
The "Pallos Negros" of the Bahia de Los Angeles is a very conscientious witchdoctor, and upon hearing of Mike's problem, came to Mike offering his professional services.

When Mike saw what an imposing man the doctor was (about 6 ft. 4 in.), he accepted.

Now, you may not believe what follows, considering that Mike was in great pain, and on crutches, but it is, according to Pat Malone, the absolute truth.

The witchdoctor had Mike lie on a bed and began to gently stroke Castor Oil on Mike's leg, from mid-thigh to mid-calf, talking to him in a low voice. He continued in this way for about half an hour, until Mike began to fall asleep. Just then the doctor twisted Mike's knee and pop, it was back in place.

With Mike completely healed, the Dunebuggy broken, the men decided to call home for a tow. After



ONE OF A KIND... Custom decrees that U.S. Presidents fly in Air Force-1, but Vic Peterson, Chief of the Aerodynamics Branch, is not to be outdone. When the State of California offered different license plates for sale the idea appealed to Vic and he came up with a new and novel "first". Here he polishes his new license plate, NASA-1, which caused great interest among the staff of the Department of Motor Vehicles and caught the eye of "The Astrogram" editor in an Ames parking area.

## BOWLING

... by Dennis Riddle

With only three more weeks remaining, the Comets lead the Keggers and 10-Pins by 4 points for first place in the upper division. In the lower division, the Alley Katz have a significant lead over the Crazy Eights, 7 points.

The awards banquet is scheduled for Friday evening, May 7, be sure and circle this date.

We are looking for summer bowlers! The season will run May 18 through August 24, bowling 6:30 p.m. Tuesdays at Moonlite Lanes in Santa Clara. There will be plenty of subs available, so don't worry about missing a few weeks for your vacation. Avoid the rush! Sign up now! Contact Dennis at ext. 2553 or mail stop 227-9.

only minor difficulties with the phone service, they reached Mrs. Malone and were soon on their way back to Sunnyvale.

There is just one final note to be added; they were ticketed in Tijuana for going the wrong way on a one-way street, just before crossing the border.

## CONGRATULATIONS

The Easter Bunny brought HARRY F. SPENCER, JR., Wind Tunnels, and his wife Kay, a very special Easter present April 3 at 6:45 p.m. Her name is Karla Easter Spencer and right now she weighs 7 lb. 13 oz. She was born at Kaiser Hospital and joins a sister Belinda Frances.

## GOLF

... by Kay Bruck

Santa Teresa was the site of the April Ames Golf Tournament. The co-chairmen, Al Petretti and Frank Lazzeroni, reported the following winners in the individual low net game:

First Flight - Tied for first place were Frank Lazzeroni, Ruben Ramos, and Chuck Turnbull; second place went to Jack Lee.

Second Flight - First place went to Vance Oyama; tied for second were Herb Ginoza and Ken Souza.

The closest-to-the-pin in the first flight (on the 16th hole) was Don Dust and in the second flight (on the 3rd hole) was Norm Barsi.

By now, all Ames Golf Club members have received their invitation to the November Turkey Shoot, "A Monterey Peninsula Golfing Weekend." This packaged weekend includes staying at the Los Laureles Lodge and playing at Laguna Seca Golf Ranch and the Carmel Valley Golf Country Club. Dates are Nov. 5 through 7 and includes 2 nights lodging (double occupancy), 2 ranch breakfasts, 36 hours of golf, power carts, awards dinner, tax and tips. Your industrious and worthy co-chairmen, Debby DeBevoise and Ruth Richardson, have been able to obtain 12 additional units at the Rancho Del Monte (right next door to the Los Laureles Lodge) for the same price, and we are now able to include a limited number of guests on a first-come first served basis. For more information and to make your reservation, call Debby or Ruth.

# WANT ADS

The Astrogram's ad section is provided as a personal, non-commercial service to Ames employees. Advertiser must be identified by name, extension and organization. The name may be left out of the ad but is needed for records. Ads must be submitted in legible writing to The Astrogram, N-241-4, by Thursday, a week before publication. The advertiser's home telephone number must be provided as a point of contact except in carpool notices.

## AUTOMOBILES

For Sale-1965 VW, needs new engine, otherwise good condition, \$200. Call 967-9479.

For Sale-1964 Pontiac Grand Prix, 2-door coupe, PB PS, auto trans., excellent condition, low mileage. Must see to appreciate, 736-0512, call after 5 p.m.

For Sale-14 ft. Rambout, 40 hp electric start, trailer, excellent cond. \$350 - 253-7945.

## HOUSING

Wanted-Visiting Research Associate requires fully furnished house or apartment for family with 3 children, for 6 weeks, July 1-Aug. 15, Call 326-0967.

For Rent-Tahoe City cottage near lake and private beach area. Sleeps 6. Spring rate \$70/wk or \$30/wknd, 328-4642.

## MISCELLANEOUS

For Sale- B-22 XL Omega. 2 1/4 x 2 1/4 enlarger with companion lens. \$200, never used, Glen A. Wendlich, 734-3773.

For Sale-Brought back too much from Europe. Carved antique vanity table \$150. Other things, 499-1638.

For Sale- Argus 300 Slide Projector, 4-inch anastigmatic f3.5 lens, manually operated, \$20. Also, 36 x 36 inch Radiant Screen, \$5, excellent condition, James Nelson, 368-7973.

Wanted-Sixth player for monthly poker game. Call Ralph Stum, 246-1887 or Norm Barsi, 948-5968.

For Sale-Rocking chair, needs some upholstery work, \$20 or best offer. Call 243-8963.

Wanted-Family interested in employing an 18-year old French girl as a live-in housekeeper, or babysitter for one month during the 1971 summer. For information call 964-7773.

For Sale-baby furniture, crib and new mattress \$15, car bed \$5, car seat \$5, high chair \$5, playpen with pad \$10, jump seat \$2.50, Call 369-8847.

Free-Kittens, mother part Persian. Kittens born March 10th. Will be available at 7-weeks, April 29. Call Virginia Hughes, 968-8436.

For Sale-Childs car bed, safety gate, high chair, car seat, jolly jump-up. Wanted - Large Wonder Horse, Call 253-6016.

For Sale-Glass Ski boat, 14 1/2 ft, with 75 Evinrude. Low hours, 16 gal. built in gas tank. Accessories include 5-gal portable gas tank, ski's and equipment, Tib trailer with large tires. Extra clean, \$875, call 968-1653.

Missing-One Hewlett Packard Time Interval Counter Model 5275 A, Ames ID # 30900. Please contact Frank Thompson, ext. 2906.

## ARA to Sponsor Happy Hour

The ARA is sponsoring a "Happy Hour" for all Ames Employees at the Ames Cafeteria on Thursday, April 29, from 4:30 to 6:30 p.m. Beverages will be served at 50¢.

## Chinese Banquet

There have been many requests for another Chinese Banquet from those who missed the one in February. Accordingly, details of the next dinner are listed below. Since there is no Saturday date open, a Friday date has been set.

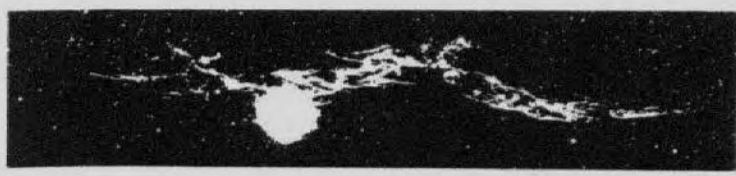
PLACE: The Golden Pavilion, 4320 El Camino Real, Los Altos (just south of the Cabana).

DATE: Friday, April 30.

TIME: No host cocktails 6:30 p.m., dinner 7:30 p.m.

COST: \$5.50 per person, including tax and tip.





# the astrogram

VOLUME XIII  
NUMBER 14  
April 29, 1971

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

## Invention Awards to Six Ames Staff

In recognition of their creative efforts six members of the Ames staff were presented with Invention Awards by the Director, Dr. Hans Mark, during a recent ceremony.

Reviewed by the Inventions and Contributions Board, NASA Headquarters, the patent applications received favorable technical evaluations and were approved for cash awards.

Four of the recipients represented the Electronics Research Branch (ERB) and shared the \$600 in awards with inventors from two other organizations here.

William F. Barrows, Flight Equipment Development Branch, received \$200, the largest single award, for an invention which provides a system for generating and transmitting a single signal conveying information as to variations in two physiological parameters, such as body temperature and EKG, and for receiving this signal to separate the two information components.

Two awards went to Gordon J. Deboo, ERB. The first was \$150 for an invention which relates to a phase shifting apparatus and provides complete selectivity of phase shift from zero to 180 degrees with no change in output amplitude due to frequency change; the second, for \$100, was a joint contribution with Roger C. Hedlund of the same branch entitled "Precision Rectifier Apparatus" which requires only a single operational amplifier and two precision resistors as operative components.

Lester Feinstein, Materials Research Branch, and Ronald J. Hrubby, ERB, shared \$100 for an invention which relates to a method and apparatus for the nondestructive testing of integrated circuit microtab welds and the like.

"High Intensity Heat Pulse Source" is the title of the invention by Larry D. Russell, ERB, for which he received a \$50 award. Mr. Russell's device is suitable for use in calibrating gauges for recording transient temperatures of short duration and, in contrast to cumbersome prior art units, it is lightweight and portable.

## Donald E. Gault Guggenheim Scholar

Donald E. Gault, Chief of the Planetology Branch at Ames, will spend the next year studying at the Max-Planck Institute for Nuclear Physics at Heidelberg, Germany, as a Guggenheim Scholar.

Mr. Gault, who first joined Ames in 1944, was named a recipient of the prestigious John Simon Guggenheim Memorial Foundation Fellowship and will continue research of impacts made by micro-particles in simulated lunar material, a field in which he has earned an international reputation. He will also complete analysis of experimental data from the Ames ballistic range facility concerned with impacts against finite bodies.

The Guggenheim Fellowships are awarded annually to assist research and artistic creation. They were founded to improve the quality of education in the arts and professions, to foster research, and to provide for the cause of better international understanding.

During his early career at the Center Mr. Gault was engaged in studies of boundary layer and stalling characteristics of airfoil sections and the stability of laminar boundary layer flows. He later initiated and carried out a research program devoted to experimental

and theoretical studies of the physics of hypervelocity impact in rock and sand. This research has been directed toward gaining an understanding of the role of impact as a geologic process in the evolution of planetary bodies. The unusual experimental facilities developed for this work were based on the use of light-gas guns and have yielded otherwise unattainable data that have led to major contributions in the interpretation of the lunar surface and its evolutionary history.

Mr. Gault has, by invitation, presented papers describing his research at NATO and Royal Society sponsored symposiums. Recognition for his work includes the award in 1967 of the NASA Medal for Exceptional Scientific Achievement "For pioneering contributions to the lunar and planetary exploration... yielding the basic description of the lunar surface..." He is presently a member of the Lunar Sample Analysis Planning Team and is a co-investigator for the study of impact craters on returned lunar rocks and a micrometeoroid detector scheduled to fly on Apollo 17. More recently he was appointed to the Imagining Team for the Mariner-Venus-Mercury '73 Mission.



DONALD E. GAULT . . . will soon leave his post as chief of the Planetology Branch for a year of study and research as a Guggenheim Scholar at the Max-Planck Institute at Heidelberg, Germany. He is pictured here with updated lunar maps.

## Youth Science Congress at Ames

Twenty-one high school students from the Northwestern states presented scientific papers at a regional Youth Science Congress held April 21-23 at Ames. The students were selected on the basis of their independent research, as judged by abstracts submitted to the program and evaluated by NASA scientists. The participants came to Ames from such distant cities as Missoula, Montana; Anchorage, Alaska; and Boise, Idaho; and from such local areas as Palo Alto and San Jose.

The program began at the Holiday Inn with a reception and dinner followed by a presentation of papers. The students were welcomed to Ames the next day by Dr. Hans Mark, Ames Director. While at Ames, the students presented papers; participated in "Rap Sessions"; and listened to addresses delivered by leading Ames scientists.

### SPONSORS

Sponsored jointly by NASA and the National Science Teachers Association (NSTA), the Youth Science Congress is coordinated at Ames by Mr. Garth A. Hull, Public Affairs Office.

The Congress' goals are to encourage promising students to enter science as a career, and to develop their abilities in science through scientific investigation.

Major emphasis is in developing the ability of these potential scientists to communicate their results to other scientists.

The student papers were of an exceptional quality, many on the level of college graduate research papers. Their topics ranged in interest from the origin of life, effects of population density and sewage treatment processes to "Quadriplegic Unit" and mathematical spirals.

Ames research scientists individually discussed mutual research interests with students during two entire afternoons. These "Rap Sessions" were established at the laboratories of the science advisors and proved a stimulating experience for students and scientists alike.

Dr. Cyril A. Ponnampertuma,  
(CONTINUED on Page 2.)



## Travel Accident Insurance Offer

All NASA employees are eligible for low-cost Travel Accident Insurance even though they may not be members of the regular Group Life Insurance program. There is no physical examination or medical statement required.

Four plans are available and are briefly described below:

PLAN I offers protection during all personal and local business travel. It provides coverage for local and worldwide personal travel by car, NASA vehicle, or by land, sea and air common carriers. You are covered 24 hours a day, 365 days a year. In addition, Plan I covers you for local business travel - trips where travel orders in accordance with Government travel regulations are not required.

PLAN II offers protection during all personal travel, just as in Plan I. Moreover, it also offers worldwide business travel protection regardless of the type of vehicle--even while flying as a passenger in a private plane.

PLAN III offers same protection as Plan II. In addition, coverage in the amount of \$50,000 is extended while piloting or crewing an administrative or program support aircraft.

PLAN IV offers same protection as Plan II and III. In addition, coverage in the amount of \$50,000 is extended while piloting or crewing a proficiency aircraft.

Optional spouse coverage for \$10,000 insurance is available under all four plans.

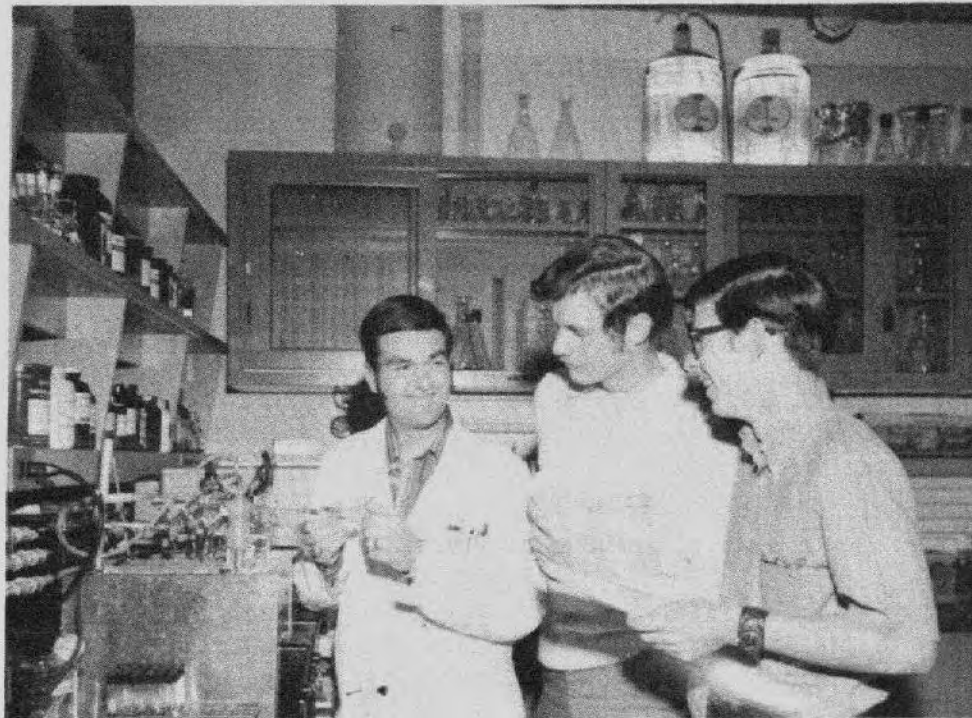
Brochures containing applications may be obtained from the Ames Cashier, Mail Stop 203-16, or the Training Office, Mail Stop 241-3.

## Catering Truck Schedule

The Catering Truck is operating on a new schedule, printed below. It should be noted that there is now no afternoon schedule.

### CATERING TRUCK SCHEDULE

9:00 a.m.	Bldg. N 211
9:15 a.m.	Bldg. N 241
9:30 a.m.	Bldg. N 233
9:35 a.m.	Bldg. N 202
9:45 a.m.	Bldg. N 244
9:50 a.m.	Bldg. N 245
9:55 a.m.	Bldg. N 238
10:00 a.m.	Bldg. N 234
11:15 a.m.	Bldg. N 240
11:30 a.m.	Bldg. N 233
11:40 a.m.	Navy Bldg. 144
11:45 a.m.	Bldg. N 244
11:55 a.m.	Bldg. N 245
12:00 noon	Bldg. N 241



"RAP SESSION" . . . Kenneth A. Souza, Biological Adaptation Branch, discusses his work with Vance Owens, San Leandro, and Douglas Phillip, Missoula Montana, two of the participants in the Youth Science Congress held at Ames recently. The Science Congress annually brings together twenty of the most promising science students from the Northwestern states to present their research and to participate in discussions and lectures conducted by Ames scientists.

## Youth Congress

(CONTINUED from Page 1.)

Chief, Chemical Evolution Branch lead a highly successful discussion on "The Significance of Science" during the students first afternoon at Ames. The following day Dr. Seymour N. Stein, Chief of the Medical Office, delivered an address entitled "NASA's Contributions to Clinical Medicine"; and Dr. William L. Quaide spoke on "A Geologist Looks at the Moon."

### AMES EVALUATORS

The student papers were evaluated by Ames research scientists Dr. Paul X. Callahan, Biochemical Endocrinology Branch, Dr. Seymour N. Stein, Chief of the Ames Medical Office and Mr. James A. Jeske of the Programming Office. Other evaluators were science teachers Mr. Willis Ball, Antioch High School, Antioch; Dr. Frank Carus, University of California, Berkeley; Mr. Greg De Cristofaro, Antioch Senior High School, Antioch, Mr. Scott Graff of Antioch Senior High School, Antioch and Mr. Richard Juba, Antioch Senior High School, Antioch.

The Youth Congress concluded with an awards program which was presided over by J.J. Ohlenchak, Chairman of the NSTA. Concluding remarks were delivered by Dr. Paul X. Callahan, Biomedical Endocrinology Branch.

## NASA Stamp Club Offer

Honoring ten years of United States achievements in manned space flight, the NASA Manned Spacecraft Center Stamp Club will issue a commemorative cover on the tenth anniversary of Captain Alan B. Shepard's flight in Freedom 7 - the Mercury Redstone 3 which was launched from Cape Canaveral on May 5, 1961.

The club's official commemorative cover will be imprinted with a multi-color cachet depicting this nation's achievements in space during the past decade, and will be postmarked on May 5, 1971 at the Manned Spacecraft Center.

SPACEPEX commemorative covers may be ordered from the Secretary, MSC Stamp Club, Box 58328, Houston, Tex. 77058 at a cost of 50¢ each. A stamped self-addressed envelope should accompany each order.

## Main Library Nears Completion

Improvements in the Main Library Building will be completed in a very short time, but there is no need to wait until everything is finished to take advantage of library materials or services.

The library is offering normal services and is open for the full working day. Personnel at Ames are welcome to use library materials and services anytime.

## AIAA Student Conference

The San Francisco and Mt. Diablo Sections of the AIAA are co-sponsoring the 1971 Region Student Conference to be held at the University of California, Berkeley, May 7 - 8.

AIAA Student Branch Members from Utah, Washington, Oregon, Arizona and California will present papers and compete for cash awards in three categories: bachelors, masters and post-masters papers. Winners in the first two categories will represent Region VI at the National Competition in Washington, D.C. in October.

The awards banquet speaker will be NASA astronaut Richard H. Truly. Lt. Commander Truly became an astronaut in September 1969 and is presently working on scientific experiments for the next Apollo mission. In his talk he will describe and illustrate some of his experiences as they relate to the challenges facing the aerospace industry and its scientists and engineers.

AIAA Section members and guests are invited to attend the awards banquet at the Berkeley City Club, Berkeley. For reservations call Connie Massie (415) 968-9457 by May 5.

## San Jose Family Camp

The City of San Jose owns and operates San Jose Family Camp, located on the middle fork of the Tuolumne River near Yosemite National Park.

This year's camping season opens Monday, June 21, and runs through Friday, September 3. Families may "check-in" at any time during the season, and are welcome to stay as long as they like. A staff is on duty to set up programs for all ages and interests. Meals are served family style in a dining hall, and tent-cabins are provided which can be furnished to accommodate from two to five persons.

For details call the San Jose Parks and Recreation Department, San Jose Family Camp, 292-3141.

**The Astrogram** Room 134  
Admin. Mgt. Building  
Phone 2385

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Editor . . . . . Dot Evans  
Reporters . . . . . NASA Employees

Deadline for contributions:  
Thursday between publication dates



## Retirement Seminar at Ames

A Retirement Seminar for employees who are considering retirement will be held at Ames on May 11.

Interested personnel may submit their name to the Training Office, ext. 2033, no later than May 3.

## Textbook Published

"Fundamentals of Aeronomy" a textbook written by Ames scientists Ilia G. Poppoff and Robert C. Whitten, Jr. of the Space Science Division was published recently by John Wiley and Sons, Inc.

The book, considered a pioneer in the field of Aeronomy, is the first to explore the entire spectrum of upper atmospheric phenomena; from physical and chemical structure, optical effects and ionospheric make-up to electromagnetic wave propagation, fluid dynamics and meteorology.

It is intended for use in a two-semester course at the senior or first year graduate level. The student is assumed to have a basic knowledge of mechanics, electrodynamics, kinetic theory of gases, thermo-dynamics, and atomic physics, as well as undergraduate mathematics through differential equations and vector analysis.

## Cost-of-Living Increase for Retired

The Civil Service Commission announced last week a cost-of-living increase of 4.5 percent in retiree annuities effective June 1, 1971.

The continued rise in the consumer index of over 3.0 percent for the third consecutive month resulted in the increase.

Federal employees who have retired or who retire on or before June 1, 1971 will be eligible for the 4.5 percent raise in annuities. The Civil Service Commission has emphasized, however, that to receive the increase the retiree must be off the rolls on or before May 1, 1971.

According to W.L. Williams, Ames Personnel Officer, the cost-of-living increase will not be reflected in annuity checks until July 1971, for the pay which the annuitant earned the preceding month of June.

Any Ames employee who is either 60 years of age with 20 years service, 55 years of age with 30 years of service, or 62 years of age with 5 years of service is eligible for this increase if retired on or before June 1. In addition, employees who have elected to be retired because of involuntary separation on or before June 1 are also eligible to receive the increase.



THE LURE OF THE ROAD . . . has captured Milt Weber, retired chief of the Materials Processing Branch, and his wife Sally. They have traveled 12,000 miles in their comfortable trailer during the past 16 months and are shown here as they prepared for another three-month jaunt. Milt is a champion archer, along with his other retirement hobbies, and packs a favorite bow and arrows when traveling to keep in practice. Both he and Sally think retirement life is great and heartily recommend it for those who are seriously considering a change.

MILT WEBER REPORTS ON HIS RETIREMENT

## Retirement—A New Way of Life

Sixteen months and 12,000 miles of trailer travel haven't begun to dampen the lust for adventure shared by Milton Weber and his wife, Sally.

In the first weeks following retirement from his position as chief of the Materials Processing Branch Milt found he had a tendency to think back on problems he thought he had left behind. "It was hard to walk out and forget everything I had been associated with so closely for so long", he said, "but I soon got accustomed to this new way of life and I wouldn't want it any different."

With 35 years of service, the necessary age to meet requirements and the "high three" Milt had been waiting for, the decision to retire was an easy one. He considers his retirement annuity quite sufficient -- helped along by the nest egg he included in his budget for a number of years.

"How can retirement be anything but a good life?" was the question he posed. Both he and Sally had a bout with cancer shortly after Milt left the Center, hopefully it has been

conquered, and they believe it has, according to medical reports. Now their next trip is all planned and they were to leave early this month for a three-month tour of the southern states, north to Minnesota where they will visit Milt's 97-year-old father, across Canada and down the coast to home in Mt. View. Sally thinks retirement is great, too, and admits she enjoys the companionship they share. Milt said, "We depend on each other and have more time to enjoy each other." A nice outlook for the future.

### VACANCY NOTICE

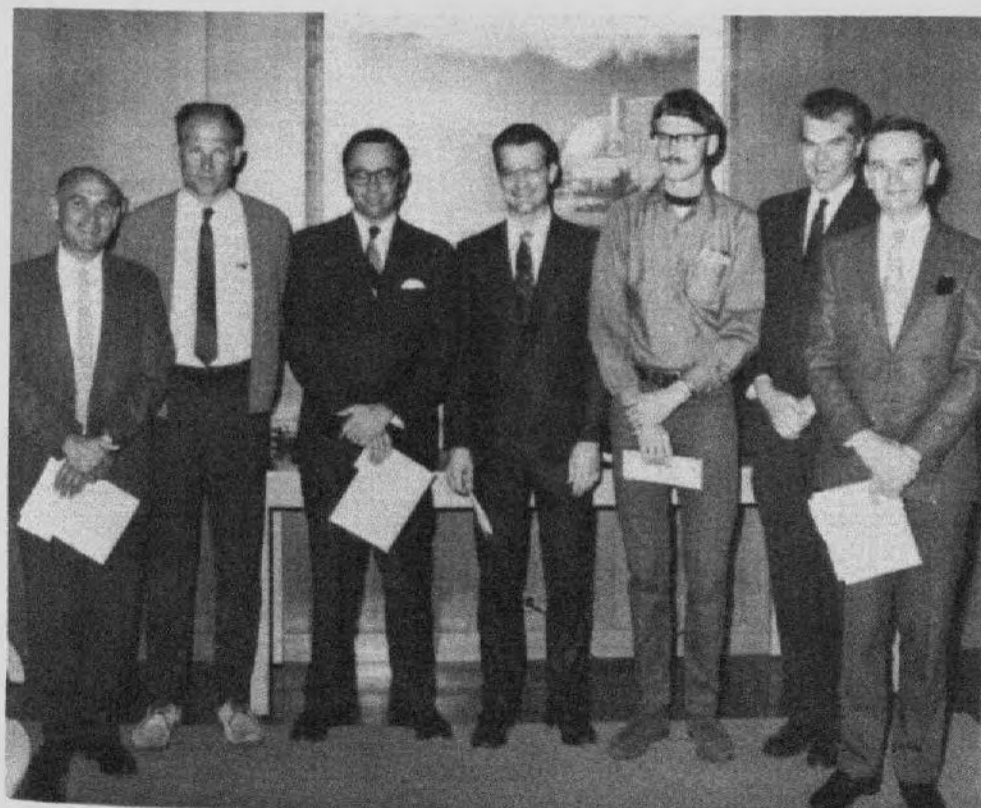
#### Merit Promotion

#### SECRETARY

Secretary (Stenographer) GS-3/8-5/6, Deputy Director of Life Sciences.

HOW TO APPLY: Interested employees should telephone the Employment Branch, extension 2021, by the closing date.

CLOSING DATE: May 7, 1971



INVENTION AWARDS . . . were presented to members of the Ames staff by the Director, Dr. Hans Mark (second from right) during a recent ceremony. Sharing the honors and \$600 in awards were (l to r) Lester Feinstein, Materials Research Branch; Roger C. Hedlund, Ronald J. Hruby and Larry Russell, all from the Electronics Research Branch; William F. Barrows, Flight Equipment Development Branch; and Gordon J. Deboo, Electronics Research Branch. (Story on Page 1)



# Ames Airings

... by Jeanne Richardson

BRADFORD P. WILSON is alive and well in the Army Air Mobility and Research Development Lab. After eleven years in the Ames Personnel Division, Brad left us for the St. Louis Army Aviation System Command. Now, after two years away, he came back; and we're glad he did. Welcome home Brad!

CHARLES W. DE ROSHIA, Physiology Branch, returned recently from a two-week visit to the Hawaiian islands with tales of hot lava flows, stranded hikers and lush tropical forests. Doesn't sound like the typical Don Ho Show, Dole Pineapple type tour of Hawaii does it?

For the first ten days Charles was on the big island of Hawaii with a group from the Sierra Club. They spent most of their visit swimming, skin diving and hiking. Charles was forced to miss one of the longer hikes due to wet equipment, but in the end was well pleased he had missed it.

The 15 hikers started out for an overnigher on Mauna Loa and ended up spending two days stranded on the volcano. It seems that three of the women hikers were not prepared for the situation and collapsed, one injuring her head when she fell. Three other hikers were taken ill with altitude sickness and three more, none of the afflicted, were sent back for help. The following day a helicopter was able to get close enough to bring the stranded people down. With a little patching, all were okay and able to continue their vacations.

Aside from that one incident, all went well. Charles and a few friends hiked to the lava beds for a night of lava watching. According to Charles, the bright liquid swirls its way across the mountain and then drops like a hot orange waterfall into the sea. Charles said that the lava makes a huge cloud of steam as it hits, then when it cools, it forms chunks of rock that float out on the waves.

After lava watching the group got permission to drive up the side of the third largest volcano on Hawaii, which is on private property. Charles said the volcano is a truly wild area, with wild sheep and goats, fruit growing in the lush tropical jungle vegetation and exotic birds.

Charles spent the last four days exploring Kauai. He hiked through Waimea Canyon and collected shells

## JOGGERNEWS

... by Jim Woodruff

The De Anza Ridge Run, a ten mile race over roads and trails sponsored by the Joggernews, was run April 18. Ninety five runners started at De Anza College; eighty nine completed the course over the hills to Stevens Creek, around the reservoir, and back over the hills to the college. The winner was Richard Delgado of the West Valley Track Club, time 60:14.8. Second and third were Doug Butt and Darryl Deardal, both running for the Marin Athletic Club.

Many runners commented favorably on the course, the marking, and the organization of the race. This promises to become a very popular race, thanks to more helpers than there is space to list. Paul Sebesta, Joggernews Racing Chairman, did an outstanding job. Vito D'Aloia, who arranged for the trophies and ribbons, and Jerry Barrack, who arranged for prizes donated by local merchants, helped mark the trail and also ran the race. Vic finishing 39 in 79:22 and Jerry 43 in 80:12. Gerd Kanning, in his first run for the Joggernews, finished 57 in 83:46. Thanks again to all who helped.

in the tide pool areas along the beach.

Now back at Ames with his shells, sunburn and beautiful memories, he claims hiking, jeeping and skin diving is the only way to see Hawaii. He should know.

It happened like this; IRV ISRAEL, Property Management, was sitting with his wife Sylvia at the Circle Star theater watching the Steve Lawrence and Edie Gorme Show. Irv wanted to make a request. So he did, from his last row seat, in a very loud voice. Wife, Sylvia, kicked Irv in the leg, very hard. Irv ignored Sylvia. Steve Lawrence couldn't ignore Irv. Steve wanted Irv to come up on stage. Irv went. Then Steve sang "Melancholy Baby" to Irv and pinched his cheek, while Irv tried to talk to Edie. Edie smiled.

When Steve finished he thanked Irv for being such a good sport, and Edie kissed him on the cheek. Irv was happy. Sylvia isn't talking to him.

### CONGRATULATIONS

PAULINE M. COOK, Graphics and Exhibits, and her husband Ken became parents for the first time April 23 when Janine Lynn was born. She weighed 7 lbs. 12 oz. and was born at O'Connor Hospital.

## AMES ADVENTURERS

Saturday morning, April 17, 38 members, friends, and spouses of the Ames Travel Club boarded a chartered bus for a two-day visit to San Simeon Hearst Castle.

The weekend started a bit slowly; the Marines apparently thought the bus looked "subversive" and would not let it onto Moffett Field for quite awhile. After arriving at San Simeon at noon, the group took the general tour of Hearst Castle. There were many oohs and aahs (and comments on the price of the entire establishment) from the Ames visitors. Then it was discovered that the charter company really hadn't confirmed the Sunday visit to the upstairs of the Castle, and, in fact no tickets were available. 38 heads got together and quickly planned a varied program for Sunday: visit to Madonna Inn at San Luis Obispo, tour of San Miguel Mission, and a very welcome stop at the San Martin Winery. Several of the group expressed the determination to confirm their OWN tickets and revisit Hearst Castle, but all in all it was a pretty well satisfied group of travelers that arrived back at Ames Sunday evening and were waved right through the gate by the Marines!

## BOWLING

... by Dennis Riddle

The Comets (Dale Frankel, Francis Genova, Joe Marvin, Otto Meckler, Jim Park, and a frequent sub, Harry D'Angelo) and the Alley Katz (Charlie Hall, Dale Lozier, Norm Martin, and Eva and Bernie Somer) have taken first place in second half for Divisions I and II. May 4, our annual sweepstakes night, will provide the opportunity for the rolloff between the winners of the two halves to determine who gets the trophies! Good Luck! Remember: banquet May 7.

NASA-Ames will be represented in the 35th Annual Santa Clara Valley Bowling Association Tournament by six bowlers who have assured us a trophy or two! Captain Dave Lozier, Harry D'Angelo, Dick Fallo, Charlie Middaugh, and Sal Tardio will be bowling in the team event at Saratoga Lanes, May 9 at 6 p.m. alley 26. Norm Barsi will join them at Fiesta Lanes, June 6 at 6:30 p.m., alleys 20, 21, and 22 for the doubles and singles events. Let's all go down to the alleys and root for their victory.

## WANT ADS

The Astrogram's ad section is provided as a personal, non-commercial service to Ames employees. Advertiser must be identified by name, extension and organization. The name may be left out of the ad but is needed for records. Ads must be submitted in legible writing to The Astrogram, N-241-4, by Thursday, a week before publication. The advertiser's home telephone number must be provided as a point of contact except in carpool notices.

PLEASE NOTE: WANT ADS MUST BE ACCOMPANIED BY NAME AND EXTENSION OF ADVERTISER. ADS SUBMITTED WITHOUT NAME AND EXTENSION WILL NOT BE PRINTED.

For Sale-1967 Jaguar XKE, bronze color, good condition, Call 257-0144 after 6 p.m.

For Sale-Mustang '65 Convertible, 289-4V, 4-speed tach., disc brakes, spec. hand., 60,000. \$925, call 736-6947.

For Sale-1962 Buick Special convertible, \$375, call 241-0733.

For Sale-1965 Chevrolet Impala, one owner, new tires, battery and starter, A/C, P.S., \$600 or best offer. Call Stan Fortenberry at 966-7417.

For Sale-1962 Chevrolet Impala, 2-door hardtop, 327 cubic in., stickshift, new brakes, good Poly-glass, tires, \$400, call 252-0145.

For Sale-Pontiac GTO, 1967, Ansen, Isky, Hurst, M/T 400 CU, 4-spd. \$1800 or best offer, call 238-0672 after 5.

For Sale-1963 Volvo 544, good condition, call 948-8964.

For Sale-1964 Pontiac Grand Prix, 2-door coupe, PB, PS, auto trans., excellent condition, low mileage. Must see to appreciate. 736-0512, call after 5 p.m.

For Sale-1966 Chevy Caprice 2-door, htp, power steering, power brakes, power seats and windows. Air conditioned, AM-FM Stereo radio, mag wheels. Call 269-3172, evenings and weekends.

### HOUSING

For Sale-Very sharp house, 3-br., 2-bath, fam rm., prof. decor. and landscp., ww carpets, drapes, elec. kit., dishwasher, 1/4 acre on quiet cul de sac. Walk to Cupertino schools. \$37,700, phone 252-6982.

For Rent-Tahoe City cottage near lake and private beach area. Sleeps 6. Spring rate \$70/wk or \$30/wknd. 328-4642.

### MISCELLANEOUS

For Sale-Solid ranch oak 6-pc. family/living room set, 5-pc. modern dinette, 88", couch and chair. "Trimmer" reel lawn mower, orig. \$200, used one season, excel cond. \$150. Call 248-2446.

For Sale-Electric Hawaiian Guitar, with 3-tube amplifier, case, Sacrifice, \$25. Call Russ Barton, evenings. 323-0890.

For Sale-Brittany Spaniel pups, pure bred, good line. \$35 each (\$70 with papers) 263-1873.

Garage Sale-May 1 and 2, 4 rooms, including appliances. 1137 Mercy St., Mt. View, or 967-0580.

For Sale-1968 Coronado 25, Sail Number 772, winner of CPYC Winter Series. Very complete boat, many extras. Call Dave Few, 328-1479 after 7, will accept Cal 20 or Sant-22 in trade.

For Sale-Puppies, Golden Retrievers, champion background; 7 in litter; 4 male, 3 female; good pet or hunting dog. Avail. May 28. Call 227-8587.

For Sale-Danish modern teak dining table and 4 chairs, 42" round pedestal type, \$125. Extra long, double size Serta Perfect Sleeper mattress, springs and frame, extra firm, \$125. Oster blender, \$10. Tank vacuum cleaner, \$20. Minox B camera and case, \$85. Call 328-0161.

For Sale-Sportliner Camper shell cabheight for 8' long narrow bed. \$120. Call Jerry, 252-4753.

For Sale-Westinghouse electric stove, excellent cond., 3 yr. old, automatic oven timer, call S. Post 323-4520.

Wanted-Either to join a small ride group or to find a ride home about once a week to neighborhood of Alma and Willow, Menlo Park. Susan Post x. 3189.

Wanted-Would the person who advertised a 1965 VW needing engine for \$200 in last issue of Astrogram please give me a call after 5 p.m., 259-0460.