

The Astrogram

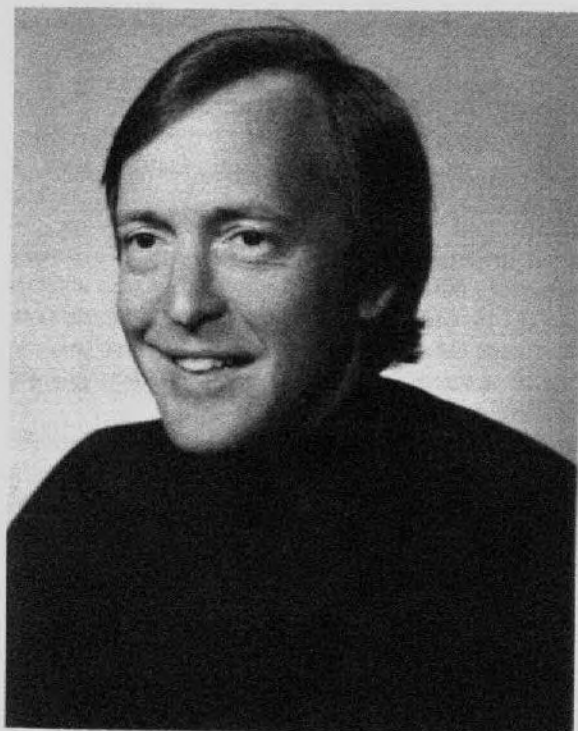
VOLUME XIX NUMBER 13

April 7, 1977

Kutler receives AIAA award

Dr. Paul Kutler, a research scientist in the Computational Fluid Dynamics Branch at Ames Research Center, has received the "Outstanding Engineer Award" from the San Francisco Section of AIAA for his contributions in the computer simulation of airflow past aircraft.

This award is presented annually to the most outstanding young engineer of the San Francisco Section of AIAA. The award was presented to Dr. Kutler at the Engineers' Banquet during Engineers Week.



Annual AIAA model contest

It's time again for the annual AIAA Model Airplane Contest which will be held on Saturday, May 7, from 9:00 a.m. to 3:00 p.m. in the San Jose City College Men's Gym at Bascom Avenue and Highway 280. The mosaic picture shows some happy contestants from previous contests holding Delta Darts, original designs, a penny-plane, and a trophy in the hands of an ecstatic winner.

The events this year will be the same as last year. Delta Dart - two divisions, 11 years and under and 12-13 years; Original Design - two divisions, 14 years and under and 15-19 years; and Penny-Plane - two divisions, 14 years and under and 15-19 years. Detailed rules for all events and free penny-plane plans can be obtained by contacting the Contest Director, George Xenakis at 5430.

The judges for the original design event this year will be Henry Tong of Accurex, Grover Alexander of Lockheed, and Bob Merrick and John McLean of Ames. Delta Darts may be purchased from Lou Young (Bldg. 244/Room 136), Joseph Steger (Bldg. 202A/Room 216A), and George Xenakis (Bldg. 210/Room 242).

Viking findings are exotic chemistry, Oyama says

Ames' Vance Oyama of the Viking biology team says that the biology experiment findings on Mars can be explained in terms of an exotic chemistry.

Oyama proposed that the results of all three Viking life-detection experiments are due to non-biological, chemical reactions based on the evolutionary history of Mars.

He advanced his theory at a meeting of the American Association for the Advancement of Science in Denver, Colorado.

Few Viking researchers are willing to go as far as Oyama in categorically discounting the possibility of life on the Red Planet. Dr. Harold P. Klein of Ames, head of the Viking biology team, and many others, believe that not enough is known, and that further investigations on Mars itself are needed to settle the "life" question.

At the same time, all are agreed that chemical explanations of the life detection findings should be examined.

Viking scientists have received biology data from two sample sites on Mars, neither of which is looked upon by the Viking team as unambiguously resolving the issue of "life or no life."

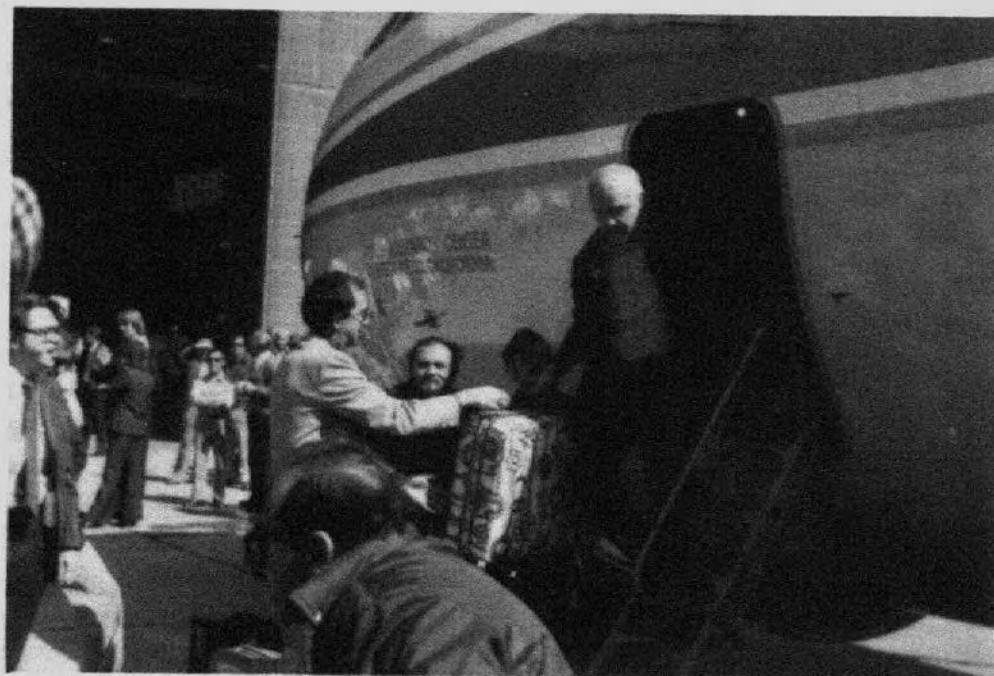
Oyama's proposal, supported by his laboratory experiments, is based on the idea that Mars today has one kind of chemistry (oxygen-based) that is so dominant that it will be found over the entire planet.

Mars, he theorizes, much like the Moon, had an early history of episodes of volcanic activity, enormous meteorite collisions, and local high heating. But, unlike the Moon, it also had an early history of abundant water. As seen in the Viking pictures, this heating forced water out of the rocks, producing violent flows, erosion, and flooding by great rivers.

Once the water was released on the surface and into the atmosphere, ultraviolet radiation and heating broke it down over time into its components, hydrogen and oxygen. Because Mars did not have enough gravity to retain the lightest element (hydrogen), the hydrogen escaped to space. This left vast quantities of oxygen, which in turn continues to produce significant amounts of unstable oxygen compounds, such as ozone, peroxides, and superoxides.

(Continued on Page 2)

KAO returns with Uranus findings



Bob Cameron (left), Chief of the Medium Altitude Missions Branch, greets Carl Gillespie, C-141 Project Manager, as he disembarks the Kuiper Airborne Observatory after the recent expedition to Australia and Pago Pago. Dr. James Elliot of Cornell University (middle) looks on. Dr. Elliot later presented his Uranus findings at a news briefing that day, Wednesday, March 30. (Story next issue.)

Primate isolation research

A major psychological problem involved in long duration space travel is isolation. This is true for monkeys as well as man according to Dr. Faren R. Akins, National Research Council Research Associate. Dr. Akins, working with scientific adviser Dr. John Tremor, is currently investigating how primate psychological performance and social interactions are affected during isolation. "Animal research has always been an important part of the space program. Now as man seeks to remain in space for longer and longer periods of time it is essential to test the reactions of other species to simulated long duration space travel. Through this we can anticipate some problems man may encounter and also prepare for actual missions involving non-human organisms," reports Akins.

Since arriving at Ames in September, Akins has been coordinating the design and construction of five primate isolation chambers. With the help of NASA engineer Andy Hocker, and electronic experts Jack Drager and Barry Smith, Akins began his investigations last January. Akins describes the chambers saying, "Each enclosure is a double animal cage with the monkeys located in separate but window connected compartments. Part of the animals have been trained to open the window when a certain cue appears. This allows us to determine how much contact the animals will work to receive each day and whether the contact is 'aggressive' or 'friendly.' Other animals are never allowed to contact each other so we can compare what behavioral differences exist between the groups."

Akins has a crew of nine local university students who assist him with the project. They use a device resembling a typewriter to record the daily behavior of the animals. Each button represents a different behavior and when pressed, a record is made of the frequency and duration of everything the animals do. This daily record helps in determining whether any behavioral abnormalities occur such as increased aggression or maladaptive self-behaviors (e.g., biting, hair pulling, etc.).



Left to right — Ames Electronic Personnel: Jack Drager and Barry Smith. Students: John Hubbard, Sal Ventura, Brian Mills, Dale Silva, Don Westbrook, Melody Walsh, Sam Charlton. Project Director: Faren Akins. Scientific Advisor: John Tremor. Ames Engineer: Andy Hocker.

Akins reports that so far, the animals in total isolation show signs of depression. They become lethargic and eat much less. Those animals who have contact with each other are surviving better but still show some strange behaviors. They rigidly pace around inside the cage and more frequently bite themselves or their partners.

Akins says that after this first experiment, he hopes to modify the isolation chambers to provide more stimulation for the animals. "We plan to add a display panel of lights and buttons we can train the

monkeys to operate in a certain sequence. This will provide something to break the boredom, but also a way to measure psychological factors such as memory, reaction time, and problem solving ability." Akins summarized his research saying, "We want to determine not only what types of abnormal behaviors develop during isolation, but also what we can do to minimize their occurrence. If primates are ever used for long duration missions, their psychological normality will be as crucial as their physical health."

Viking findings are exotic chemistry, Oyama says

(Continued from Page 1)

Oyama suggests that: Most of the rocks, sand, and soil particles of Mars are coated with iron oxides, which include gamma ferric oxide, which is magnetic and was seen by the Viking magnetic experiments. This compound "breaks off" an oxygen atom from the atmospheric ozone or hydrogen peroxide, both unstable oxygen compounds. Over time, these oxygen atoms diffuse through the iron oxide coating to the rock underneath. There they form superoxides with the alkaline earth oxides and metal oxides in this rock.

This means that both the atmosphere and the soil contain oxygen-unstable compounds, which over time would not allow organic materials to form on the planet, or to persist if they were formed. This has, in fact happened, Oyama suggests, and accounts for the complete absence of organic material on Mars. Oyama proposes the following effects on the three Viking life detection experiments:

In the Viking Labeled Release experiment, the gamma ferric oxide could also catalyze the oxidation of formate (nutrient) and other organics to produce carbon dioxide.

In the Pyrolytic Release experiment, Mars ultraviolet-activated atmosphere chemistry can also explain the apparent synthesis of organic matter. Carbon sub-oxide, a "sticky" carbon-oxygen molecule, may be formed in the atmosphere by ultraviolet radiation of carbon dioxide. Carbon sub-oxide molecules then stick together to form large molecules (polymers). In the Pyrolytic Release

experiment, the labeled carbon dioxide activates the surface of these large polymers, and sticks to them. Polymers are then converted back to monomers (single carbon sub-oxide molecules). These stick to the experiment's organic vapor trap, until they are baked out by high heat, as labeled carbon dioxide. This chemical explanation again fits Oyama's soil chemistry model, and can be used to explain the origin of this labeled carbon dioxide in the PR experiment.

Oyama's soil chemistry model also seems to be confirmed in other ways, he says. Viking's landing site (Utopia) is apparently wetter than the southern Viking site. The greater water content in soil at the northern site accounts for the lesser amount of nitrogen, argon, and carbon dioxide released by the soil at Utopia in Oyama's Gas Exchange Experiment. This is because greater amounts of existing water at Utopia stuck to soil particles, taking the place of part of the gases which coated similar soil particles at the drier southerly Viking site.

More water at Utopia also could account for the lower peak of radio-active-labeled carbon dioxide released by high heating in the Pyrolytic Release experiment there. The greater amounts of water at Utopia should have decreased the uptake of carbon 14 in the previously-described carbon sub-oxide polymer, resulting in the lower amount of "organic material" (labeled carbon dioxide) at Utopia under high heat.

Although Oyama feels that the biology results can be satisfactorily explained by his model, many biologists still feel that the possibility of life on Mars remains, its activity perhaps being masked by such reactive chemical processes. It is also possible that life is present in locales other than the two Viking landing sites.

Thank you

To all my dear co-workers and friends at Ames, thank you so very, very much for the beautifully engraved silver platter, the fantastic tape recorder, and the gorgeous red roses presented to me at my retirement party at the Officers Club on March 22. It was a delightful affair and I am most appreciative of your thoughtfulness. It was indeed so overwhelming to see all of you who were there and also to receive the kind wishes expressed by those who were unable to attend. It was a fantastic luncheon, followed by a tremendously funny, witty program. I shall remember it and you always! God Bless!

Grace Webster
(Perfect "37")

(Retirement Luncheon: after 37 years & 9 months!)

Women's news

Boss/secretary breakfast

"The Boss/Secretary Management Team" will be the topic of Dr. Robert Dyer, keynote speaker at the Secretaries Week Breakfast to be held at the Ames Cafeteria Tuesday morning, April 26, 1977. The buffet breakfast will be served at 7:30 a.m., and a brief program will follow.

Dr. Dyer, President of Robert Dyer Associates, is well-known to many of the Ames people. His major function as a management consultant is working with organizations and their people in helping them to have greater effectiveness in the "people" area—developing positive personnel interaction and greater individual satisfaction. He is planning a thought-provoking keynote address.

The Secretary/Executive Breakfast is being cosponsored by the Women's Program Committee and all the Employees Advisory Groups here at Ames, and by the local Mission Trail Chapter of the National Secretaries Association. Secretaries and bosses from Ames are urged to attend—if your secretary or boss cannot come, please come anyway. By sharing the observance of this week with the local NSA Chapter, Ames will have as special guests executives and secretaries from local organizations, including colleges and universities, aerospace and electronic firms, city and county offices, etc., and a tour of Ames is planned, following the breakfast, to let our interested visitors get a glimpse of Ames' activities.

The price of the breakfast is \$3.00 per person. Send in your reservation PROMPTLY on the flyers which have been circulated. If you have not seen any information about this breakfast, contact Vera Buescher (5760, mail stop 239-11) and she will send you the information. **PLAN TO ATTEND!**

Publication

"Woman Alive!", as PBS series returns in April with 4-hour long weekly special programs. Local PBS stations, KTEH and KQED, will begin their showings on April 12 at 8 p.m. and April 14 at 10 p.m., respectively. The first in the series in "Job Discrimination: Doing Something About It." It's a combination of recent history of and how to resolve sex discrimination on the job, ranging all over the country and all over the employment field. The following week "Woman Alive" presents "A Time of Change," Joan Shizekawa's film on where the women's movement is now. The third program is "Men, Women: What's the Difference?"—a national test exploring the real and imagined differences between the sexes. Finally, "The Fifth World" will focus on women in the international scene.

Women's rights handbook

The State of California, Department of Justice, has just come out with a very informative pamphlet for women. It's entitled "Women's Rights Handbook." It covers services and/or rights women have in the areas of employment, child bearing, credit, education, housing, insurance, domestic relations, business public assistance, day care services, and rape. To get your copy, write or call:

California Department of Justice
Information Services
350 McAllister Street
San Francisco, CA 94102
(415) 557-3888

Ask for Department of Justice Information Pamphlet No. 9, "Women's Rights Handbook."

FWP logo winner

The Federal Women's Program recently announced that Frank Zblewski of the Defense Nuclear Agency, Washington, D.C. is the winner of the Federal Women's Program Tenth Anniversary Logo Contest. Zblewski's design was chosen over more than 1400 entries from around the world.

An interagency panel composed of graphics specialists and friends of the Federal Women's Program made the final selection. The judges were seeking a design which would be clearly recognizable; not become quickly dated; be appropriate to the interest of women of any age or race; convey a sense of professionalism in the program; uniquely represent the Federal Women's Program; and be capable of effective reproduction in black-and-white and of reduction to 1/2 inch in size.

Winner Zblewski is the Chief of the Design Branch for his agency. He has been with the Defense Nuclear Agency since 1970, and has previously designed posters advertising Federal Women's Program activities in the agency.

The panel of judges which selected the winning design included Ludwig Andolsek, Commissioner of the U.S. Civil Service Commission; Betty Moran, Art Director for the Savings Bond Division of the U.S. Department of the Treasury; Richard Shackman, Assistant Commissioner for Administration, Patent and Trademark Office, U.S. Department of Commerce; Elwood Schuler, Supervisory Graphics Designer, CSC; and Aileen Joyce Skinner, national headquarters Federal Women's Program Coordinator for the U.S. Department of Housing and Urban Development.



The judges also recognized as semi-finalists LaVerne M. Love and Maureen Healy, Smithsonian Institution, Washington, D.C.; Patricia Schreiber, Chicago; SSGT Rodger D. Hill, Moody Air Force Base, Evelyn Reinginger, FWPC, Bergstrom Air Force Base; and Gilbert Rudolph, Naval Ship Weapon Systems Engineering Station, Port Hueneme, California.

Zblewski will be honored during an award ceremony in early 1977 when he will be presented with a plaque bearing his design. The semi-finalists will receive certificates of appreciation.

Notice

Plan to see Textronix, Inc. Interactive Graphics Display Cruiser at Ames on Friday April 15th from 9-12 noon behind Bldg. 233.

ARA STORE—The ARA Store in the cafeteria has just been remodeled and enlarged. Stop by and see the "new look" Tuesdays and Thursdays from noon to 12:45 p.m.

SUMMER BOWLING LEAGUE—Sign-ups for the Summer Bowling League are being accepted now by G. Rathert, Ext. 5168, Mail Stop 243-1 and D. Petroff, Ext. 6699, Mail Stop 227-5.

NASA INTER-CENTER JOGGING COMPETITION—The next NASA Inter-Center Jogging Competition will be held April 26 and 28. A two-mile race will be held on April 26th, a four-mile race on April 28th. This time children and spouses will be eligible and are encouraged to participate due to a new ruling awarding bonus points based on the number of participants, so every runner counts!!! Each race will be held twice; once at 11:30 a.m. and again at 5:00 p.m. to accomodate spouses and children. Ames has the revolving trophy now for winning the last competition and we'd like to keep it. For more information, call Bruce Castle, Ext. 5089.

Fastpitch Softball

The NASA Ames Fastpitch Softball Team starts off the 1977 season with the following schedule:

April 12, 7:45 p.m., Backesto Park, Ames vs. Lenny's Lounge.

April 13, 7:00 p.m., Washington Park, Ames vs. Jaybirds.

April 19, 9:00 p.m., Backesto Park, Ames vs. Pal Stars.

April 26, 9:00 p.m., Backesto Park, Ames vs. Mission Plastering.

Future dates will be published in the Astrogram. Backesto Park is located in San Jose and Washington Park is in Sunnyvale. The team is seeking its third championship in a row so lets give the team your support by coming out to the games.

Scuba Club

The Ames Scuba Club will meet on April 13, 1977 in the Ames Cafeteria. The meeting will begin at 12:45 and be over by 1:30. Plans for a club dive will be discussed.

FTS number change

There has been a reassignment by GSA of an FTS number which is causing a great deal of misrouted calls and confusion. It appears that FTS telephone number 984-3311 originally was assigned to Dryden Research Center through December and is now assigned to the MSFC Resident Office at Canoga Park, CA. Apparently, this change has not been well publicized since the number of calls placed to the MSFC Resident Manager at Canoga Park are actually intended for Dryden. The Resident Manager indicated, the majority of misrouted calls are originated within the Agency.

It is requested that each center inform their telephone operator of this FTS telephone number change. Further, it is suggested that a notation of this change be included in whatever type of employee bulletin issued at your respective center.

Ames Promotion Plan vacancies

Notice No.	Title	Grade	Org.	Area of Consideration	Closing Date
77-48	Secretary (Typing)	GS-4/5	SPP	Centerwide	4-15-77
77-49	AST, Experimental Facilities and Equipment	GS-11/12	FSV	Centerwide & Outside	4-15-77

TO APPLY: Call Extension 5559 or 5600

MERIT PROMOTION PLAN SELECTIONS

Notice No.	Title	Org.	Name
77-2	Supy. AST Technical Engr. Operations Mgt. (Chief User Applications Branch)	SEA	Cancelled
77-26	Wind Tunnel Mechanic - Shift Leader	FAO	Cancelled
77-33	Contract Specialist	ASR	Terrance Mahurin
77-40	Secretary (Typing)	SP	Joy Raiburn

Want ads Transportation

1972 Ford Ranger pickup, F-250, 8-ft bed with Paratop shell, 8100 GVW with 9.50 x 16.5 wheels, 390 CID, AT, PS, PB, A/C, 45 gal tank, other extras. New HD battery, brakes, front tires, good rear S/M tires. EZ Lift trailer hitch, KH electric brake control, 82,000 mi. Priced for quick sale, financing available. \$3200. Bernie Cunningham, 867-4233.

1971 Maverick 250-6 cylinder Automatic Transmission, A/C, PS, New Tires and shocks. \$1600. Excellent Condition in and out. Call 969-5613 after 4 p.m.

1973 Pontiac Ventura, Hatchback, V8, Custom, AC, PS, PB, Automatic, SBR Tires, very good condition. \$2100. 854-0729 (eves).

1976 Datsun B210, 4dr, 4 speed, \$3000, or \$200 and take over payments. Call 272-2603 after 6 p.m. M-F, anytime S-S.

1970 VW Bug, very low mileage, excellent tires and condition. \$1250. 374-8142 Evenings.

1973 Capri, V6, delux decor group, 4 speed, steel belted radials, 46,000 miles. \$2500/best offer. M. Sarjeant, 272-0287.

22' Racing-Daysailing SAILBOAT, trailer, sails, cover. Fast, exciting "Bay" keel boat. \$2900. 854-0729.

Wanted - Serviceable used car for student. Automatic, No major repairs eminent. Call evenings 241-0693, ask for Orvel Flowers.

Housing

FOR RENT - Eichler, immac. 4 BR., 2 BA., fam. rm., fireplace, 2 car gar., AEK. refig, dshwshr., disp, new no-wax floors, new cpts and drps, lovely private yards, prime Palo Alto location, close to schools and Ames. Lease \$550 mo. Call 964-1725.

FOR RENT* Top neighborhood, 3 BR, 2 BA, carpets, drapes, 2-car garage, fireplace, fenced backyard, fruit trees, 8 miles, easy drive to Moffett Field. Available May 1. 252-3937, evenings.

FOR RENT: Secluded A-Frame at South Tahoe. By week (\$150) or weekend (\$75). 948-9301.

FOR RENT: 2 Bedroom house in Los Altos. \$300. per month. Call 964-7289. Ideal for young couple.

FOR RENT: Spacious Los Altos 4 BR, 2 BA home with family room on 1/4 acre, lovely neighborhood, near parks & tennis courts, and summer school, completely furnished including linens and dishes, gardner included. June 8 - August 8. \$550 mo. Call 961-4218.

FOR RENT: 3 BR, 2 BA, 2 car garage, dishwasher, disp., fireplace, carpets, drapes, Cupertino Schools, near De Anza, no pets, \$415 mo. Available 4/1. Call 967-1652.

FOR LEASE: Single family house. 3 BR, 2 BA, db. garage, location near shopping center and school, in San Mateo area. Call 345-6295.

FOR RENT: Compl. furn. 4 BR Eichler, near Fremont and Mary. Avail for 5 mo. beg. May 15; \$500mo. 732-2870.

FOR RENT: Sharp 4 BR, 2 1/2 BA, AEK, Indoor Laundry Room, water and garbage paid, full carpeting, drapes, freshly painted, clean townhome, near 680 and McKee, not too far from 101 in San Jose. Reasonable. Call 926-6065. Available by 4/1.

ROOMATE WANTED: To share 2 BR, North Mt. View, Furnished Apt with Male. Available May 1. \$138/mo. Call 965-0845.

Miscellaneous

FOR SALE - Comfortable blue-green tweed lounge chair, \$50. Gray vinyl round ottoman, \$10. 35mm Zeiss Contessa w/case in excellent condition \$75. (408) 243-5382.

CB Johnson SSB Viking 352, \$275. Call after 6 p.m. M-F, anytime S-S. 272-2603.

Moving Sale - Extra high quality Furniture: Bedroom Suite: American of Martinsville - Renaissance Design. 9 pcs. including 2 night stands, headboard, large dresser with 2 tall mirrors, high boy, Beautyrest mattress and box springs. Living Room: 3 piece sectional; Chinese Modern. 1 lg. Oriental lamp, rectangular Oriental picture, sectional has ebony trim. Love Seat: Lime oak; green Naughahyde. Antique Highboy with secretary. Call after 6 p.m. or weekends 293-3559.

Formal French Provincial dining room table with 4 chairs, \$250. Two matching end tables, one square and one octagon, black slate tops, \$150. After 4 p.m. 984-8168.

Drapes, 250 x 94, 3 panels, off white, heavy duty, custom made, in good condition. \$60. Call 964-1725.

MISSING FM LIFE SCIENCES LIB - Back issues of 2 journals "Life Sciences" and "General & Comparative Endocrinology." Please return - No questions asked.

Anyone interested in 50 pounds of stabilized dry chlorine for use in a pool, contact D. Black at x 5527.

Would you like to play Duplicate Bridge? We meet twice a month on Thursday evening. Very friendly atmosphere. This is just a fun evening, no master points given. If interested call Joe Rokovich, 739-6054.

Dinette table, six chairs, \$175; Hide-a-bed, \$195; Magnavox stereo, \$65. All excellent condition. 252-5596.

FOR SALE - Gaffer and Sattler 4 burner, continuous cleaning electric stove, white with black glass oven door. In fine guaranteed condition \$150. 243-5382.

FOR SALE - Galaxy R-530 General Coverage Receiver, .5 - 30 MHz, \$350. Call 262-3767 after 5:00 p.m.

SPRING GARDEN SALE - by Foothill Mens Garden Club, April 9, Rancho Shopping Center, Los Altos. Featuring drought compatible plants.

FOR SALE - Zenith color TV, 23 in. Metal console. \$200 or best offer. 961-3804.

FOR SALE - Stained and finished Burl coffee table \$90. EZ lift trailer hitch \$50. Encyclopedia Americana with annuals 1949-1962, best offer. Call 967-8240.

Bicycles for men, boys, and girls. \$15 ea. 493-6841.

10' x 12' Cabin Tent, good condition, \$30. Upright Freezer and gas clothes dryer, available May 1, \$50 ea. Call 739-3382.

Sleeping bags, very little used, \$15 ea; wall lamp, good condition, \$15; study lamp \$10. Call 964-1725.

Three small old style refrigerators approximately 10 cubic feet, in good working order. Great for a garage. \$35 ea. Call Jim Cirner 967-7672.

"Aces"... All those interested in establishing an "Alternate Consumer Energy Society" - ACES, to conduct monthly discussions and educational programs about technical material and systems such as solar collection, wind-powered equipment and methane generators as well as buyer services and do-it-yourself programs. Call x 5739.

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The Astrogram

VOLUME XIX

NUMBER 14

April 21, 1977

Lomax receives National AIAA award

Harvard Lomax, Chief of the Computational Fluid Dynamics Branch, will be presented the AIAA Fluid and Plasma Dynamics Award during the AIAA 10th Fluid and Plasma Dynamics Conference in June. The award is for his outstanding contributions to the theoretical analysis of supersonic aerodynamics by small perturbation theory and to the computer simulation of aerodynamic problems by pioneering research in the development of numerical methods with application to computational fluid dynamics.



Lomax joined the NACA Ames Aeronautical Laboratory in 1944 upon graduation from Stanford University. He has devoted over 32 years to research in theoretical aerodynamics.

In the past six years, computational fluid dynamics has become recognized as a viable alternative to wind tunnel tests for aerodynamic design studies. Harvard Lomax has made major contributions to all aspects of this field: the development of specialized program languages (invited lecture at the SIGNUM Meeting on Software for Partial Differential Equations, Moffett Field, California, Dec. 8-9, 1975); the study of numerical methods (invited lecture at the AIAA 2nd Computational Fluid Dynamics Conference, Hartford, Connecticut, June 19-20, 1975, and review paper in "Annual Reviews of Fluid Mechanics, vol. 7, 1975); and the solution of aerodynamic problems for subsonic, transonic, and supersonic speeds. He headed a team of six scientists responsible for the computer simulation of convection in the tank of a rotating spacecraft (NASA TR R-386, 1972). This project was initiated following the Apollo 13 mishap, and the computer simulations showed that the cause of the explosion - the electric heater - was unnecessary to obtain circulation of the liquid oxygen.

In addition to his personal contributions, Harvard Lomax as Chief of the Computational Fluid Dynamics Branch directs the research activities of 22 scientists and 7 National Research Council postdoctoral associates. Under his guidance the Branch has made many significant contributions to computational fluid dynamics during the past six years and is internationally recognized in this field. The caliber of the research is exemplified by the recent acceptance of 5 papers by the Vth International Conference on Numerical Methods in Fluid Dynamics, Enschede, The Netherlands, June 28-July 2, 1976; 5 papers by the AIAA 9th Fluid and Plasma Dynamics Conference, San Diego, California, July 14-16, 1976; and 12 papers by the NASA Conference on Aerodynamic Analyses Requiring Advanced Computers, Hampton, Virginia, March 4-6, 1975.

All in the family



Take stock in America.
Buy U.S. Savings Bonds.

AIAA Galileo Scholarship Award

Since the Galileo Memorial Scholarship Program was established in 1973 by the AIAA San Francisco Section and NASA Ames Research Center, five \$500 scholarships and eleven \$50 Savings Bonds have been awarded to high school seniors, who are now attending universities across the country. For 1977 the value of the scholarship has been raised to \$750 and the finalists will receive \$100 Savings Bonds.

The 58 applicants currently being evaluated for the 1977 Scholarship represent the outstanding science and engineering-oriented seniors from the local high schools. The winner and five finalists will be feted at the May Section meeting. Plan to attend and meet these talented students and twenty delegates to the Youth Science Congress from throughout the state of California on Thursday, May 5th, in the Ames cafeteria at 6 p.m. for cocktails, 7 p.m. for dinner (\$8.00), and 8 p.m. for the presentation. Contact Jane Cordell, ext. 5114, before May 3rd, for dinner reservations (New York steak).

Prof. Arthur E. Bryson, Jr., Chairman, Department of Aeronautics and Astronautics, Stanford University, will talk on "Fascination of Fluid Flow."

Ames - Lead helicopter Center

The National Aeronautics and Space Administration has now officially begun implementation of its plan to establish Ames Research Center as lead Center for helicopter research.

Approved last summer, the plan resulted from a NASA assessment of its overall research activities to identify areas where realignment would increase the effectiveness in research output and reduce costs. This is of particular importance in view of growing competition from foreign industry in the helicopter field.

Consistent with its roles and missions responsibility for short-haul air transportation, Ames was designated the leading NASA Center for helicopter research. Both NASA's Langley Research Center and Lewis Research Center, however, will have responsibilities for key segments of the helicopter activities.

Ames will conduct helicopter research on small-scale and large-scale hardware using aeronautical facilities including its 40- by 80-foot wind tunnel and flight simulation capabilities and will conduct flight tests with research rotorcraft such as the Tilt Rotor Research Aircraft and Rotor Systems Research Aircraft.

Langley will emphasize helicopter structures and continue some disciplinary research in acoustics, airfoils, aeroelasticity, and avionics components.

Lewis will emphasize helicopter propulsion with the first step being a proposed new program in helicopter transmission technology. This program will include helicopter engine technology in a later phase.

A NASA Headquarters Helicopter Program Office will be responsible for formulation of the overall agency helicopter program and integration of the research efforts of Ames, Langley, and Lewis.

Over the next three years these changes will result in 72 positions being added to the Ames staff. During the period of transfer, the Langley activity in helicopters will be phased down but will continue at a level of 72 man-years engaged in continuing helicopter work.

With the expected growth in Langley Long-Haul Aircraft Technology activities, it is anticipated that there will be little long term impact on Langley manpower and the local economy.

New degree program

University of Santa Clara is considering the development of an Engineering Management within their School of Engineering. It would be directed at mid-level management for engineers with 4-5 years experience. The program would require 45 quarter units and lead to a Master of Science degree. Course work would be divided 60-40 between technical and business and would be offered as part of the "Early Bird" (7:00-9:00 a.m.) schedule.

Persons who might be interested in this program should call the Ames Training Office, ext. 5623, so we can assist Santa Clara in their planning.

Uranus' rings discovered

(Continued from last issue)

Rings orbiting the planet Uranus — the first major structures in the solar system to be found since the discovery of the planet Pluto in 1930 — have been identified by Cornell University researchers flying aboard the NASA-Ames Research Center Kuiper Airborne Observatory.

Uranus is the seventh planet out from the Sun, one of the giants of the outer solar system. It is almost 1.6 billion kilometers (a billion miles) beyond Saturn, until now the only ringed planet, and is unique in "lying on its side" with its rotation axis almost in its orbit plane.

Dr. James Elliot, senior research associate at Cornell's Center for Radiophysics and Space Research, assisted by graduate student Edward Dunham and computer programmer Douglas Mink, made the discovery on March 10 while they were observing the temporary disappearance (occultation) of a faint star behind Uranus. The expedition was carried out by the Ames Center's Kuiper Observatory project team, headed by Carl Gillespie, expedition manager. The observations were made at 12,300 m (41,000 feet) altitude, 2,000 km (1,200 miles) southwest of Australia over the southern Indian Ocean.

Elliot and his associates have inferred the presence of five rings orbiting Uranus, all of them in a narrow belt 7,000 km (4,400 miles) wide, lying 18,000 km (11,000 miles) out from the cloud tops of the planet. The five rings appear to consist of four thin inner rings, perhaps 10 km (6 miles) across, that follow nearly circular orbits around the planet, and one thick outer ring, about 100 km (60 miles) wide, whose orbit may not be exactly circular.

Observations of the Uranus occultation made independently at Perth, Australia by Robert Millis of Lowell Observatory, and by astronomers at Cape-town, South Africa agree with the interpretation of at least five rings surrounding Uranus.

The rings are considerably smaller than those encircling Saturn. Elliot's data indicate that they are probably made up of fragments smaller than two kilometers (one mile) in diameter. They have never before been observed, because the light reflected from the planet is sufficiently bright to obscure the lesser reflections from the rings under normal viewing conditions, Elliot said.

Elliot has named the rings for the first five letters of the Greek alphabet — alpha, beta, gamma, delta and epsilon.

Ames' Kuiper Observatory, from which the observations were made, is a national facility available to astronomers. Named for pioneer planetary astronomer

Gerard P. Kuiper, who discovered Uranus' fifth moon, it carries the world's largest airborne telescope, and has made various discoveries. For the Uranus flight, because of its mobility, the C-141 provided the best solution, flying far out over the southern oceans. It flew far enough south to be well within the shadow of Uranus, and far enough into the Earth's night hemisphere to see occultations of the rings on both sides of the planet, as well as to be above any clouds. This combination of factors was not possible from any single ground-based observatory, and, in fact, several ground observatories were clouded out.

Viewing of the second ringed planet was done through the Observatory's 91 cm (36 inch) telescope, stabilized by gyroscopes and a tracking system that compensates for changes in altitude of the plane during flight. The C-141 flew above 75 percent of the Earth's atmosphere. Data were displayed for the Cornell observers on a television screen, and variations in intensity of the light were recorded on magnetic tape and plotted automatically on graph paper.

Elliot and his associates observed the occultation of the star SAO 158687 by Uranus to learn the planet's precise diameter and to study the composition and temperature of its atmosphere by recording changes in the light intensity from the star as it passed near and then behind the planet. The discovery of the planet's rings was an unexpected benefit.

Ames ophthalmoscope revived

In 1962 Ames designed and developed a special movie recording fundus camera with a cost estimated at a half million dollars. The camera has recently been reactivated with the help and voluntary time of Ames retiree, George Holden. This instrument which is unique in design, can be remotely operated and is centrifuge rated. Among the projects it was used for at Ames was the first proof that the retinal blood vessels collapse at high G's producing blackout. After several years at Ames it was loaned to collaborators who had either worked on it or helped design and work with it. Among the places it was sent were the University of Oregon and San Antonio, Texas and the University of Southern California. In San Antonio, Sid Leveritt used the instrument on pilots, and at USC Dr. Meehan used it for the study of sickle cell anemia and for observation of blood flow after decompression.

The camera was returned to Ames last summer ('76). Enough interest had been generated in its application that reactivation seemed feasible. Ames was fortunate to obtain the services of a recent

Ames retiree, and one of the original designers, George Holden, who volunteered his time to debug and rebuild the one-of-a-kind equipment. Another original participant in its design, Dr. Paul Bailey, also volunteered his time to come down from Oregon at crucial stages and function as a consultant and ophthalmologist. Both Holden and Bailey invested numerous nights and weekends as did two Ames people, Chuck Turnbull and Del Philpott. The first photo of a human retina were taken on the rebuilt ophthalmoscope Sunday, March 6th. Projects to be done using the reactivated instrument are:

Rod effects on the blood vessels of the eye

Correlate the doppler effect sensor with the visual collapse of the blood vessels.

Dr. Dick Haines will be using it in the dynamics of blood filtering of retinal blood vessels under various levels of stress; and how all the oxygen in the blood vessels relates to visual function. Dr. John Greenleaf is planning to do some work with the ophthalmoscope. His group is interested in looking at the influence of various intensities of exercise on changes in the retina.

Security information

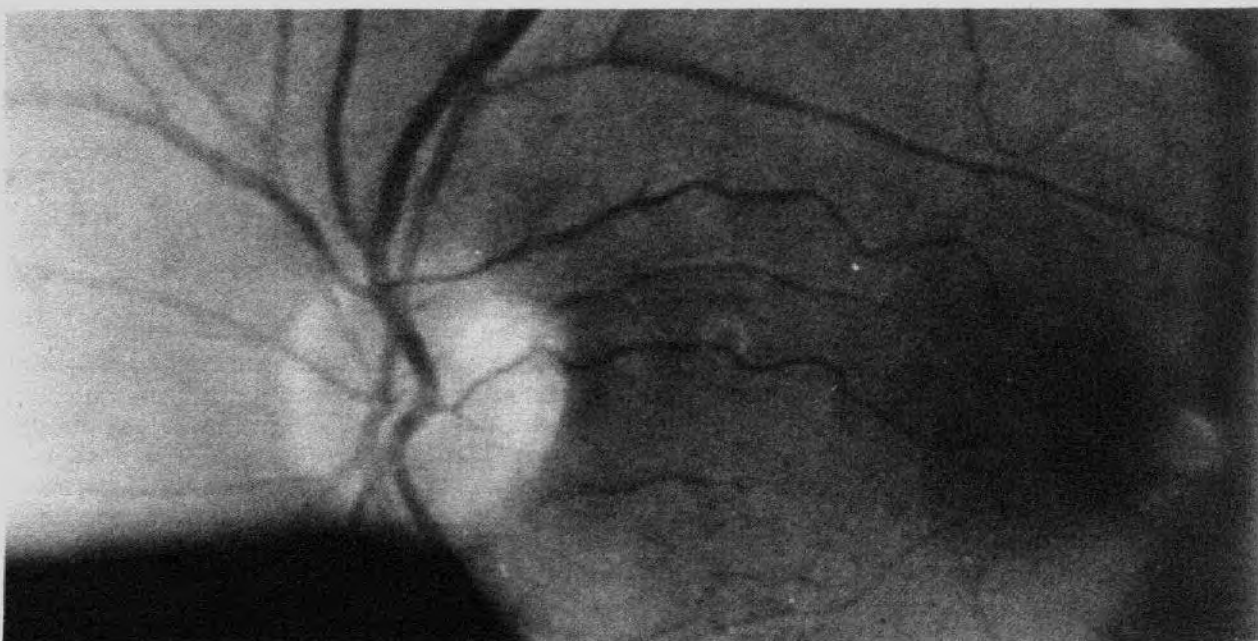
Thieves made off with at least \$1.7 million in government and personal property from federal office buildings in 1976.

The total theft and vandalism figures could actually be as high as \$16.7 million, according to an estimate prepared for the General Services Administration, the federal agency that manages and protects the buildings.

The wide discrepancy between the reported total and the estimates resulted from inadequate record-keeping by government agencies. A GSA spokesman said the agency is currently revising the procedure for reporting thefts.

Since there are 1452 government-owned buildings and 7140 leased buildings, it's hardly surprising that valuable items like calculators, typewriters, and audiovisual equipment are ripped off on a regular basis.

Some of the items reported stolen less frequently range from the exotic to the mundane. Cars, tires, gasoline, binoculars, TV sets, clocks, American flags, chain saws, outboard motors, fire extinguishers, toilet tissue, barbed wire, trash cans. Even entire safes have been pilfered.



Below is a picture of the normal blood vessels of the human eye as photographed on the newly rebuilt ophthalmoscope (eye donated by Paul Bailey).

1977 Bedrest Study participants



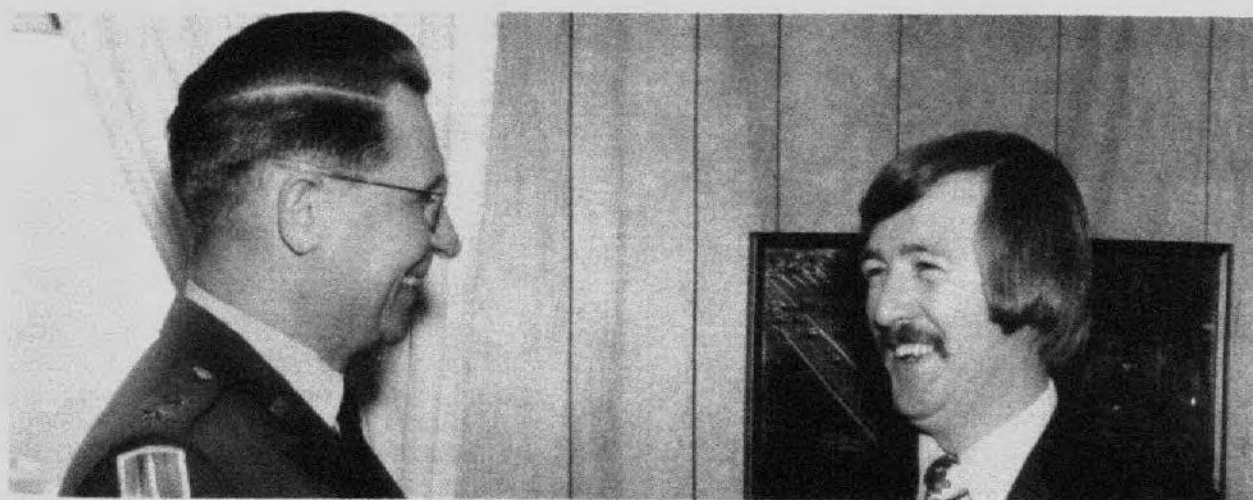
Participants in 1977 Bedrest Study include the following women: (front l to r) Charlene D. "Kitty" Johnson, retail sales clerk, Montara, CA; Mary C. Gerbino, housewife/free-lance writer, San Jose, CA; Carol Pruitt, licensed vocational nurse, Dublin, CA; Gloria A. Martinez, vacuum deposition technician, Milpitas, CA; Nance Lou Deardorff, banker, San Jose, CA; (rear l to r) Rita L. McIntire, electronics technician, Milpitas, CA; Marion Hays, free-lance writer, actress, Alameda, CA; Wendy L. Heyman, drapery manufacturer, San Jose, CA; Chrisula Asimos, teacher/medical researcher, San Francisco, CA; Christine Smith, homemaker/registered nurse, San Jose, CA.

1976-77 CFC award to Fisher and Lewis



Captain B. J. Adams, commanding officer of the U.S. Naval Air Station, Moffett Field, presents an award for outstanding fund raising efforts in the Combined Federal Campaign to NASA employees David L. Fisher, center, and Ralph Lewis, right. Fisher served as 1976-77 campaign chairman for NASA-Ames Research Center, in the drive which distributes funds to the United Way, International Service Agencies, and National Health Agencies. Lewis served as a United Way "Loaned Executive" for the campaign, working in the United Way offices during the 10-week fund raising effort.

Dean Borgman wins Army's 2nd highest award



Dean C. Borgman, Chief, Systems Research Integration Office (SRIO) received a Meritorious Civilian Service Award from Major General Eivind H. Johansen, Commander, Army Aviation Systems Command (AVSCOM), St. Louis, MO, during special ceremonies held at AVSCOM recently. This is the Army's second highest award for civilian employees.

The citation, which covers the period July 1971-November 1976, noted that "Mr. Borgman's outstanding technical ability, knowledgeable management, tact, and diplomacy have contributed immeasurably to the establishment of a highly effective and responsive R&D program for air mobility."

Save energy and money

Join ACES — the Alternate Consumer Energy Society at Ames Research Center. The first general meeting — April 26th at 11:30 in the Space Science Auditorium, Bldg. 245.

Learn about Home Solar Hot Water Heating, Pool Heating Systems, "Backyard" Bioconversion Systems, Wind Generators, Water Conservation, Electric Cars. Through a series of meetings on subjects requested by members you can obtain information and assistance on a wide range of projects from the do-it-yourselfer to evaluation of commercial systems.

There is considerable in-house expertise at Ames and these experts will share their knowledge and experience and perhaps generate new ideas through this exchange. We are also in contact with the ACES group at the Jet Propulsion Laboratory and will be exchanging information with them.

ACES first program on April 26th will present a grand overview on "NASA's Total Energy Conservation House." This house was constructed at Langley using NASA technology and commercially available materials for \$55,000.00. It includes all forms of energy conservation including heating, insulation and water. Herb Holley from Ames Technology Utilization Office will present the information and data about this NASA house which has surpassed all expectations.

Golf

The Ames Golf Club is off to a good start this year and it's time to get caught up with the news. The first tournament of the year was held at Sunnyvale Municipal Golf Course on February 12th. Co-chairmen Earl Menefee and Conrad McCloskey report the following winners of the Best-Ball Twosome:

First Flight: 1 — P. Barisich, F. Lazzeroni; 2 — P. Kutler, F. Johnson; 3 — A. Petretti, J. Martin; 4 — J. Mullen, O. Koontz; 5 — R. Ramos, B. Odneal.

Second Flight: 1 — B. Ross, L. Hochstein; 2 — J. Cayot, A. Joly; 3 — P. Quattrone, G. Falkenthal; 4 — B. Scott, C. Eddy; 5 — H. Yanagita, V. Oyama.

Third Flight: 1 — B. Gray, J. Weyers; 2 — C. McCloskey, A. Lopez; 3 — B. Quattrone, J. McCloy; 4 — W. Page, S. Brovarney; 5 — R. Dowell, N. Barsi.

Our second tournament of the year was held on March 5th at Sunol-Cypress. Co-chairmen Ed Tischler and Earl Levin report the following individual low-net winners:

First Flight: 1 — P. Barisich, 2 — J. Lee, 3 — F. Lazzeroni, 4 — A. Petretti.

Second Flight: 1 — H. Mathews, 2 — J. Hlad, 3 — N. Martin, 4 — P. Kutler.

Third Flight: 1 — B. Ross, 2 — B. Scott, 3 — A. Lopez, 4 — D. Davis.

Fourth Flight: 1 — J. Weyers, 2 — W. Page, 3 — S. Brovarney, 4 — A. Wong.

Fifth Flight: 1 — W. Harry, 2 — D. Johnson, 3 — F. Weyers, 4 — F. Demuth.

Officers of the Golf Club this year are R. Ramos, president; J. Cayot, vice-president; R. Denison, secretary; D. Banducci, treasurer; and F. Lazzeroni, handicap chairman.

Tournament Chairmen Bill Ross and Art Joly report the following winners of the point-par event held at Spring Valley Golf Course on March 26, 1977:

First Flight: 1 — O. Koontz, 2 — P. Barisich, 3 — M. Orozco, 4 — A. Petretti, 5 — D. Banducci.

Second Flight: 1 — J. Weyers, 2 — A. Joly, 3 — E. Levin, 4 — B. Ross, 5 — E. Tischler.

Third Flight: 1 — S. Brovarney, 2 — B. Quattrone, 3 — C. Banducci, 4 — E. Watson, 5 — S. Tardio.

Ames Promotion Plan vacancies

Notice No.	Title	Grade	Org.	Area of Consideration	Closing Date
77-50	Supervisory Aerospace Engineer	GS-14/15	FHI	Centerwide & Outside	5-2-77
77-51	Supervisory Aerospace Engineer	GS-14/15	FHR	Centerwide & Outside	5-2-77
77-52	Supervisory Aerospace Engineer	GS-14/15	FD	Centerwide & Outside	5-2-77
77-53	Aerospace Engineer	GS-13/14	FSD	Centerwide & Outside	5-9-77
77-54	Aerospace Engineer	GS-13/14	FSN	Centerwide & Outside	5-9-77
77-55	Supervisory Aerospace Engineer (AST, Flight Systems)	GS-14/15	FH	Centerwide & Outside	5-9-77
77-56	Budget Analyst	GS-7/9/11	AR	Centerwide & Outside	4-29-77
77-57	Contract Specialist	GS-12/13	ASR	Centerwide & Outside	4-29-77
77-58	Secretary (Typing)	GS-4/5	FLI	Centerwide & Outside	4-29-77
77-59	Computer Aid/Technician	GS-4/5	FAX	Centerwide & Outside	4-29-77

TO APPLY: Call Extension 5599 or 5600

MERIT PROMOTION PLAN SELECTIONS *

Notice No.	Title	Org.	Name
77-38	AST Technical Resources Management	SEM	George Alger

Credit Union news

The Moffett Field Employees Credit Union has declared a 6-1/2 percent per annum dividend for the period January 1, 1977 through March 31, 1977. This dividend, according to John F. Pogue, President of the Board of Directors, reflects a continuing growth in the credit union. This dividend was posted to member account on April 1, 1977.

Want ads Transportation

Honda CB100 Motorcycle, 85 mpg. Transportation bargain of the year, \$250. 734-5800 days. Leave message if not in.

For Sale: 1974 Norton 850. \$900. Call 728-7158.

For Sale: Toyota Corona, 4 door, 4 speed, air, radio, 14,500 miles, immaculate. Call 246-8286.

1961 Porsche, new engine, clean body and interior, stereo, \$4000. Call Jeff (evenings) 446-0259 or 948-6084.

Wanted for Rent - Camper-van for a coast-to-coast round trip in July. Family of 4. Call Seginer, 493-9372, evenings.

For Sale: 17' Lo Liner Aristocrat Travel Trailer, self-contained, excellent condition, \$2195. Phone after Sunday, 264-4627.

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.

Miscellaneous

Original oil paintings for sale. Well known Bay Area artist. Call after 5:00, 274-9043.

For Sale: IBM Executive typewriter, very good condition, \$200. Call 244-8380 after 6 p.m.

Newly painted white dresser with natural wooden knobs. \$40.00 or best offer. Call 965-5241 days, or 327-0544 evenings.

CRT Tester, B&K model 465, excellent condition. \$60/offer. 734-7471 days.

BAR/DOT Generator HeathKit model IG28, excellent condition. \$70/offer. 734-7471 days.

For Sale: 19" Remote control Panasonic color TV/stand. One year old, warranty available, \$400/offer. Call after 6 p.m. weekdays - anytime weekends, 275-1257.

WANTED - House-Dog sitter. May 6-May 30. Call Toon, X5593.

ARA ACTIVITIES

ELECTION RESULTS - The results of the recent ARA Executive Board Election are in. Congratulations to Paulette Burgess, Rod Bailey, and Willie Douglas as newly elected members of the Board and to Stan Benbow and Armando Lopez who were reelected. New officers for the 1977/78 Executive Board were elected and welcome comments, recommendations or suggestions from you for the 1977/78 season. Call any Executive Board member listed below:

Armando Lopez, President, Ext. 5568

Denise Lucy, Vice-President, Ext. 6645

Rod Bailey, Secretary, Ext. 5990

Paulette Purgess, Treasurer, Ext. 5370

Judy Long, Happy Hour Coordinator, Ext. 5874

Willie Douglas, Happy Hour Coordinator, Ext. 6101

Allison Ybarra, ARA Store Coordinator, Ext. 5410

Ray Sargis, ARA Store Coordinator, Ext. 5465
ARA Information Phone, Ext. 5412

Thanks to outgoing members Joanne McArthur, who served as trustworthy treasurer burning the midnight oil to balance the books; Jan Kennard, who worked long hours organizing special events and activities and was in charge of the ARA Store; and to Earl Levin, who served as secretary this last year and always had the minutes ready along with Judy's quips interjected here and there. Thanks to all for all your hard work and don't worry, we'll call you if we need you.

JOGGING COMPETITION - The next NASA Inter-Center Jogging Competition will be held **April 26 and 28**. A two-mile race will be held on April 26th, a four-mile race on April 28th. This time children and spouses will be eligible and are encouraged to participate due to a new ruling awarding bonus points based on the number of participants, so every runner counts!!! Each race will be held twice; once at 11:30 a.m. and again at 5:00 p.m. to accommodate spouses and children. For more information, call Bruce Castle, Ext. 5089.

Retirement luncheon

Jerald Dickson is retiring after 34 years of service. A luncheon will be held at the Moffett Field Officers' Club on May 4, 1977. Contact Joe Smith or Joe Zuccaro at 5169 for information.

Thank you

Many thanks for the retirement luncheon which you made possible. A special thanks to Tom Almojuela, Mike Orozco, Fred Baker, Frank Pauli, and the lovely model. We will enjoy the portrait lighting equipment, and will put it to good use.

Thanks again,
Denise & Cecil MacDonald

To my many friends at Ames:

Thank you all for coming to my retirement party and for the beautiful photo enlarger you gave me as a present. I shall always think of my happy association at Ames whenever I look at it, and the pleasant working conditions and people I had the privilege of knowing there. I intend to be around from time-to-time, so this is only a note of thanks, and not farewell.

I wish all of you good health and good fortune, and may you also look forward to a happy retirement.

My warmest regards,
Kay Bruck

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The Astrogram

VOLUME XIX

NUMBER 15

May 5, 1977

Kelly honored by AHS award



Mark W. Kelly of the Aircraft Guidance and Navigation Branch has received American Helicopter Society's Paul E. Heueter Memorial Award.

The purpose of this award is to recognize significant contributions to the development of VTOL aircraft other than helicopters. It consists of an individual plaque, and his name engraved on a plaque which is on display at the Smithsonian Institute.

Kelly will accept the award at a luncheon in his honor on May 11 in Washington, D. C.

AIAA model contest

The annual AIAA Model Airplane Contest will be held on Saturday, May 7, from 9:00 a.m. to 3:00 p.m. in the San Jose City College Men's Gym at Bascom Avenue and Highway 280. The mosaic picture shows some happy contestants from previous contests holding Delta Darts, original designs, a penny-plane, and a trophy in the hands of an estatic winner.

The events this year will be the same as last year. Delta Dart-two divisions, 11 years and under and 12-14 years; Original Design - two divisions, 14 years and under and 15-19 years; and Penny-Plane - two divisions, 14 years and under and 15-19 years; and Penny-Plane - two divisions, 14 years and under and 15-19 years. Detailed rules for all events and free penny-plane plans can be obtained by contacting the Contest Director, George Xenakis at 5430.

The judges for the original design event this year will be Henry Tong of Accurex, Grover Alexander of Lockheed, and Bob Merrick and John McLean of Ames. Delta Darts may be purchased from Lou Young (Bldg. 244/Room 136), Joseph Steger (Bldg. 202A/Room 216A), and George Xenakis (Bldg. 210/Room 242).

(Photo on Page 2)

CFC results

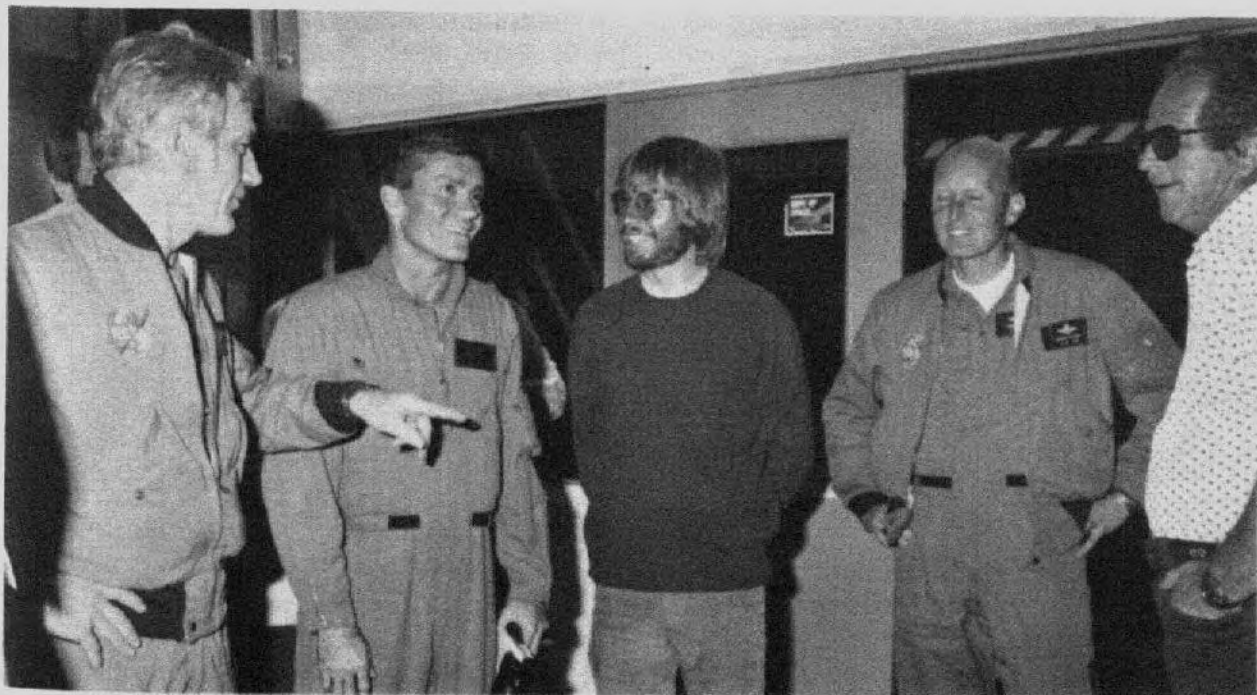
David L. Fisher, Chairman of the Ames 1977 Combined Federal Campaign, has reported that the final Ames contribution total as filed with campaign auditor this year was \$61,554.60. Ames has traditionally been a strong supporter of CFC and this year was no exception as shown in the following table taken from the CFC Final Report documents.

	Participation	Average Gift	Per Capita Gift	% Increase Over Previous Year
Ames	88%	\$40.23	\$35.54	10.6%
County Wide	62%	\$25.77	\$15.98	5.1%

It is interesting to note that Ames with approximately 12% of the Federal employees in this county gave almost one fourth of the total contributions. Ames exceeded the 1977 CFC goal of a 10% increase in contributions whereas the County Wide CFC effort fell far short at 5.1%. Ames was singled out for special acknowledgment at the meeting for its high degree of participation and excellent overall performance in the 1977 CFC campaign.

The participation and cooperation at all levels at Ames in the CFC campaign was truly outstanding. Fisher particularly commended all of the Division coordinators and solicitors whose efforts were, in a large part, responsible for the success of the campaign. John Giboney of the Financial Systems Office received special mention. Through his considerable efforts he provided for the financial accountability of all funds. His continued participation has brought a needed level of continuity in the financial management and accounting area of the campaign.

Denver and Shuttle pilots visit ARC



Last month, singer, composer, pilot, and space enthusiast John Denver (middle) visited ARC along with NASA's three Space Shuttle pilots, (left to right) "Deke" Slayton, Fred Haise, and Gordon Fullerton. Denver's father, M. J. Deutchendorf (far right), as test pilot, also accompanied the group. The visitors had been invited to the Center to fly a Space Shuttle simulation on the FSAA. Denver, his father, and brother, Ron, each alternately flew the simulation with Haise and Fullerton. Deutchendorf commented that he reflected the day as being "one of the most fantastic experiences of his flying career."

Marty Knutson, Chief of the Airborne Missions and Applications Division, presented Denver with a U-2 photo of Aspen, Colorado, Denver's home.

The Ames Aeronautics Directorate (specifically, Mike Wash), hosted the celebrity on his visit to ARC.

(More Photos on Page 2)

Ames/AVS symposium

A symposium will be held at Ames on May 9-11, 1977 sponsored by NASA and the American Vacuum Society to promote discussion of experiments which would utilize the unique characteristics of the Space Shuttle as an experimental platform in the 1980's. The symposium is organized to include a segment, presented by NASA, devoted to a description of systems, capability, environment, current programs and future plans, and past experience in orbital-based research. A second segment, sponsored by the AVS, will include presentations on possible experiments within the technical areas of interest to members of the AVS. In addition, a session of contributed papers and a panel discussion on new payload possibilities are scheduled.

The technical portion of the program will be supplemented by a symposium dinner on Monday evening, May 9, at the Paul Masson Vineyard.

A symposium registration fee of \$15 is being assessed for all participants, including Ames employees. Any one desiring a program outline or registration information should contact Allison Ybarra at Mail Stop 230-3, extension 5410.

Technical Utilization award recipients



In January of this year, Dr. Hans Mark presented Certificates of Recognition plus a \$50 award to 20 NASA employees.

The following innovators received awards: Wendell D. Chase for "Multiplane Binocular Visual Display" (Tech Brief-ARC-10808) and "Full Color Hybrid Display System For Aircraft Simulators" (Tech Brief-ARC-10903); Bennett J. Tyson and Glenn C. Carle for "Separation of Water From Air Samples Collected at Cryogenic Temperatures" (Tech Brief-ARC-10890); Ronald J. Hruby for "Capacitive Potentiometric Shaft-Angle Encoder" (Tech Brief-ARC-10897); George G. Shillinger, Jr. for "Spring-Operated Accelerator For Biomedical Studies" (Tech Brief-ARC-10898); James R. Rogers for "Wing-Tip Smoke Generator" (Tech Brief-ARC-10905); Fred R. Lemos for "All Nickel Hot-Wire Probe" (Tech Brief-ARC-10905); Bruce W. Webbon for "Tubular Sublimator-Evaporator Heat Sink" (Tech Brief-ARC-10912); Theodore Wydeven for "Abrasion-Resistant Coatings for Plastic Surfaces" (Tech Brief-ARC-10915); Henry Lum, Jr. for "Automatic Fire Weather Data Station" (Tech Brief-ARC-10993) and "Automatic Balance For Fuel Moisture Model" (Tech Brief-ARC-11032); Donald R. Young and Wayne H. Howard for "In Vivo Bone Strain Telemetry" (Tech Brief-ARC-11074); Salvatore Rositano for "Systems for Measuring Mandibular Motions" (Tech Brief-ARC-10956); Yutaka Matsumoto and Robert A. Blomseth for "Automatic Balance for Fuel Moisture Model" (Tech Brief-ARC-11032); John A. Parker for "Fiber-Modified Polyurethane Foam For Ballistic Protection" (Tech Brief-75-10062); Wilbur G. Vallotton for "An Artificial Leg Employing A Mechanical Energy Storage Device For Hip Dis-Articulation" (Tech Brief-ARC-10916); Richard F. Haines for "Designer's Protection Reticle" (Tech Brief-ARC-10976); William D. Gunter, Jr. for "Schlieren System Employing Antiparallel Reflector in the Forward Direction" (Tech Brief-ARC-10971); Bill A. Williams for "Liquid-Cooled Brassiere" (Tech Brief-ARC-11007).

NASA provides a \$50 award to the innovator(s) of each Ames Tech Brief published through the Technology Utilization Program. Tech Brief material is not restricted to technical subjects alone but is a program in which all AMES employees can participate. The only requirements are that the technology is novel and has utility beyond aerospace applications. Assistance is provided by the Ames Technology Utilization Office in reviewing and advising innovators as to the utilization of proposed Tech Brief material.

ARC employees pose with Denver



Posing with singer John Denver in the Ames Hangar are ARC employees (l. to r.) Louise Boyce, Connie Cadruvi, Brenda Bradford, John Denver, Joan Showers, Linda Miser and Kay Cherbonneaux (Mrs. James).

Wm. Laurie receives SAA

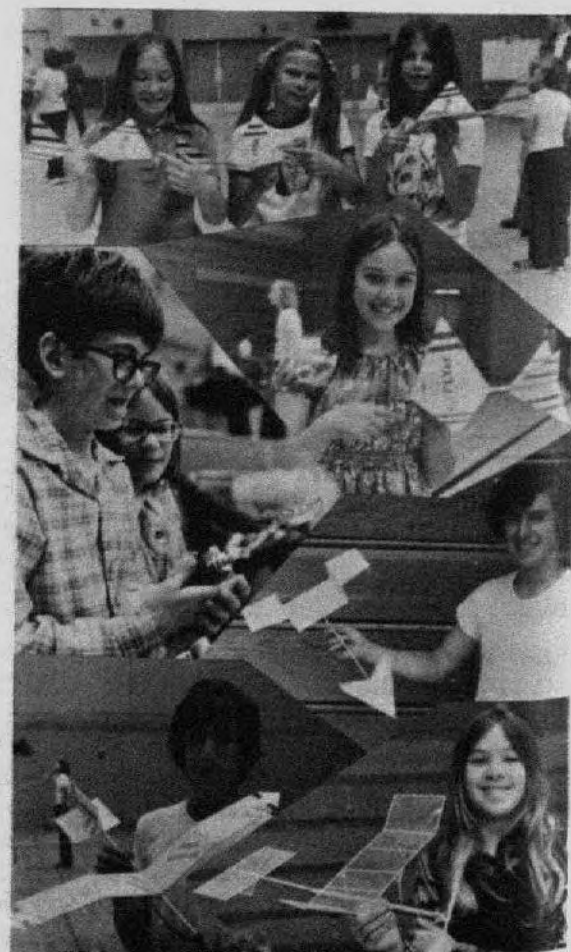


William Laurie, Aircraft Services Branch, recently received a Special Achievement Award from Center Director, Dr. Hans Mark. Laurie's award was based on his outstanding performance and money saved the government while working as crew chief of the Augmentor Wing Aircraft.

The Augmentor Wing is a modified DeHavilland Buffalo which has been plagued with fuel tank leaks most of the time since its modification. After two previous attempts at having the tanks sealed had failed, Laurie developed and applied a tank-sealing method of his own. His methods were successful and they saved the government an estimated \$35,000 - the cost of having the job contracted out.

'76 Model contest

(Continued from Page 1)



NASA oil tracking

Imagery from NASA aircraft is assisting the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Coast Guard in tracking the oil spill from the grounded tanker Argo Merchant off Nantucket Island, Mass.

At the request of NOAA, NASA is conducting the overflights and analyzing the data from the ocean around the grounded tanker to obtain trajectory data on the slick. Flights were conducted on Dec. 19, 22 and 23, 1976, and additional flights will be made as requested. The flights were coordinated by Langley Research Center Va., and conducted by Wallops Flight Center.

NOAA plans to use the data to refine and validate analytical models for use in studying the potential environmental impacts associated with off shore oil and gas production on the outer continental shelf.

Fittings seminar

A seminar on high pressure fittings will be held for all interested Ames employees, contractors, and students. The seminar will cover the correct procedures for the installation and re-make of Swagelok fittings.

Mr. John L. Briggs of the Sunnyvale Valve and Fitting Company (formerly the Van Dyke Valve and Fitting Company) will conduct the course. His company supplies Ames with the types of high pressure fittings the Ames High Pressure Safety Committee recommends.

The hour long course, beginning at 10:00 a.m. will be held on the following days:

Thursday, May 12, Bldg. 227, Room 304/305

Tuesday, May 17, Bldg. 227, Room 304/305

Wednesday, May 18, Bldg. 241, Room 147/149

Thursday, May 19, Bldg. 241, Room 147/149

If you are interested in attending, please call the Training Office, extension 5622 to sign up as seating is limited.

Golf

Cochairmen Jim Martin and Tex Ritter report the following winners for the Individual-Low-Net-Tournament, held at Riverside Golf Course on April 23, 1977:

First Flight: 1 - O. Koontz, 2 - P. Kutler, 3 - J. Martin, 4 - J. Lee, 5 - N. Martin. Nearest the pin won by J. Martin.

Second Flight: 1 - P. Quattrone, 2 - E. Meneffee, 3 - A. Lopez tied with D. Davis, 4 - D. Chausse tied with B. Scott. Nearest the pin won by D. Davis.

Third Flight: 1 - S. Brovarney, 2 - E. Tischler tied with E. Hample, 3 - R. Dowell, 4 - F. Wirth. Nearest the pin won by G. Rathert.

Fourth Flight: 1 - E. Watson, 2 - K. Bruck, 3 - W. Harry tied with N. Barsi, 4 - B. Quattrone. Nearest the pin won by E. Watson.

Safety corner

Heart health test

As a follow-up to the *Heart Health Test* which was shown in October 1976, the Stanford Heart Disease Prevention Program will broadcast *An Introduction to Stress Management*. This 1-hr video tape program includes a complete demonstration of a deep muscle relaxation technique that could be extremely valuable in reducing stress. It is hoped that this program will assist people in reducing tension in their daily life, possibly an important step in reducing the potential risk of cardiovascular disease.

An *Introduction to Stress Management* will be shown at noon on May 20, May 27, June 3, and June 10. If you are interested in viewing this videotape, please call the Training Office, extension 5622, to sign up.

DeFrance honored



Those actively participating in the ceremony included from left to right: Manley Hood, Dr. Hans Mark, Dr. Smith DeFrance, Dr. Harry Goett, Professor Walter Vincenti and Dr. V. R. Watson. Hood, Goett and Vincenti are former Ames staff members. Watson is from Theoretical and Planetary Studies and Chairman of AIAA San Francisco Section.

At a special AIAA ceremony on March 15, Dr. Smith J. DeFrance, retired Director of Ames Research Center, was presented with a certificate and pin symbolic of his election to Honorary Fellowship in the Institute. The citation was "for his leadership in directing and building NASA-Ames Research Center to a position of eminence in aerospace research and development." In addition to his influence felt by the surrounding physical facilities,

his influence on the lives of his colleagues was noted by the speakers, Dr. Harry Goett, Mr. Manley Hood, Prof. Walter Vincenti, and Dr. R. T. Jones.

The presentation was made by Dr. Hans Mark, and Section Chairman Dr. Val Watson read a telegram from NASA Administrator Dr. James C. Fletcher noting DeFrance's 25 years at Ames "among the truly outstanding accomplishments of this Agency and one of the most remarkable and productive careers in our field of endeavor."

Army Commendation Medal to Hodges



Captain Dewey H. Hodges, center, Aerospace Engineer, Ames Directorate of the Army Air Mobility R&D Laboratory, NASA-Ames, received the Army Commendation Medal "for exceptionally meritorious service from May 21, 1973 to February 10, 1977. During this period, Captain Hodges made outstanding contributions to the technology of the dynamic stability analysis of rotary-wing systems. In addition to his preparation of a large number of technical publications, he pursued the application of this technology to the dynamic problems of fielded Army helicopter systems."

The medal presentation was made by Colonel John B. Fitch, Deputy Director of the Laboratory, as Dr. Irving C. Statler, Director of the Ames Directorate, looked on.

The next day, Captain Hodges traded his uniform for civilian clothes and a short time later Dr. Hodges resumed his career with the Ames Directorate of AMRDL.

Ames Promotion Plan vacancies

Notice No.	Title	Grade	Org.	Area of Consideration	Closing Date
77-60	Accounting Technician	GS-4/5	AFC	Centerwide & Outside	5-13-77

TO APPLY: Call Extension 5599 or 5600

MERIT PROMOTION PLAN SELECTIONS

Notice No.	Title	Org.	Name
77-41	Electronic Engineer (AST, Data Systems)	FAE	Dana Firth
77-44	Accounting Technician (GO)	AFC	Paula Flagg
77-46	Communications Clerk (Typing)	AAC	Christine Kast (Outside candidate)
77-48	Secretary (Typing)	SSP	Vicki Deiwert
77-57	Contract Specialist	ASR	Cancelled
77-	Secretary (Typing)	LR	Stephanie Ferea
76-126T	Supervisor, Space Scientist (Chief, Atmospheric Experiments Branch)	SSG	William Page

Ham Flea Market

Come one, come all, to the Ham Flea Market, Saturday, May 21, 1977.

Sponsored by EMARC "WB6WSL" (Electronics Museum Amateur Radio Club).

Where? Foothill College, 12345 El Monte Ave., Los Altos Hills, (Highway 280 and El Monte Ave.), Parking Lot "T" - by the Museum.

Opening time: 9:00 a.m. for sellers and buyers.

Sellers space: First come bases. \$3.50 per exhibit space (2 parking stalls).

Restricted to electronic gear.

Ames Business Cards

As the ARA Treasurer for 1977, Paulette Burgess is now the contact for ordering of Ames Business Cards. Call 5169 or mail your request to Paulette Burgess, Mail Stop 243-5. Business cards are available at \$9.00 for 250 black on white print and red NASA logo.

Thank you

I want to thank each and everyone of you who made my retirement luncheon so enjoyable. I loved the presents and will make use of every one.

Chan Frost.

Want ads Transportation

1968 Mercury Monterey Sedan. One owner. Excellent condition. PB, PS, PW, air cond., new upholstery. \$1095 or offer. Call 253-6016 after 5 p.m.

FOR SALE: 1965 4-door Ford Galaxie in good condition. Excellent work car, \$650/offer. Call after 4:00, 738-3098, ask for Doug.

FOR SALE: Volvo, 1970, gray, 4-door sedan, Model 164, automatic shift, radio, good tires, \$1,990. 326-9839 after 5.

FOR SALE: 1975 AMC Hornet Hatchback w/air cond., AM/FM/8-track, \$3000 or best offer. Call 252-1228 anytime.

FOR SALE: 1974 Suzuki TS 185 Enduro. Perfect condition: 3800 miles. Phone 267-3012. \$550.

VW '76 Rabbit. Superb cond. Sunroof, deluxe int/ext pkg., perf. pkg. 2-dr + hatchback, 4-spkr AM/FM stereo w/cassette. Choc. brown w/tan leatherette int. 28K. \$5011 new. \$3675. 733-1153, 5 p.m.

Dunebuggy, 140 HP, top, side panels, mags, plus many extras. Super nice, fast, reliable. \$1800? Make an offer. 265-9818 evenings, Ken.

'76 Kawasaki KV100 dirt bike, like new (only 350 miles). \$600 or best offer. Call Chuck McClinton, 272-1812, evenings.

Housing

FOR RENT: 2 bdrm, 2 bath duplex, built-in kitchen, private laundry room. Rose Garden Area, 1696 Park Ave., San Jose, \$275/mo., \$75.00 cleaning deposit. Call: 268-3449 between 3:00 and 5:00 p.m. or weekends.

TAHOE CITY townhouse. Pool, tennis, sauna, fireplace, color TV, phone, washer/dryer, AEK, snack bar. Sleeps 6-7. \$80 weekend, \$175 week, \$450 month. Reserve now for summer. P. DeRamo. (415)685-1220 evenings.

FOR LEASE: Sunnyvale, Cherry Chase Area, 3 bedrooms, 2 baths, 2-car garage, covered patio, carpets, drapes, stove, dishwasher, disp., close to schools, stores and Moffett, available \$410.00. Call Walter Reese, 245-5120.

Try an energy-saving vacation! Rent our modern, luxury condominium at Santa Cruz Beach and Yacht Harbor. Furn., 2 br., 2 ba., AEK, 2 private view decks. Sleeps 6. Avail. by the week, 6/12 to 9/10. Don Frolich, 245-3243.

FOR RENT: Ten weeks, 6/21 to 8/30. Completely furnished townhouse, 1½ miles from Ames. Two bedrooms plus den plus office, 2½ baths, LR, DR, large kitchen. Total \$900 includes utilities, pool. Car also available if desired. Call 961-5993, Jerry Smith.

FOR RENT: Beach house at Pajaro Dunes (near Watsonville). Completely furnished, including linens; cleaning included in the rent; beautiful views of Monterey Bay, 100 feet from the beach; tennis courts. Reserve now for summer. Call John Lundell, 252-7260.

HOME FOR RENT: Ditz Crane home, 6 months old, 2 story, 2000 sq. ft., 4 bedrooms, 2½ baths, family room, living room, dining room, AEK, dishwasher, self-cleaning double oven. Custom drapery, up-graded carpet. Fireplace, smoke detector, large front and back yard, prime North Valley Area. Near all schools, park, library and shopping. 20 minutes to Ames. Very quiet and convenient. \$450/month. Call 965-5043 after 6 or weekends. Immediately available.

Miscellaneous

FOR SALE: Camper shell, insulated, \$200. Call Joe Rebollo after 5:00 p.m., 967-3204.

FOUND: Tennis racket. Call D. Ralph to identify. Days 965-5381.

LOST: Car cover, green, for 356/Porsche. Call Bob Carros, 965-6088 days, or 968-5638 evenings.

WANTED: Room and board with American family near Foothill College for one or two 18-year-old Iranian students. Approximately \$150.00 per month. Call Mrs. Hans Mark for references (948-1736).

FOR SALE: Healthy tumbler pigeons, \$1.00 per pigeon, \$2.00 mated pair, call Keith, 253-6294.

CAR POOL. Room for one more. Evergreen area. Quimby and White. Phone 238-3390.

Housesitter: Reliable student(s) with references. Available from 6/6/77 to 8/31/77 (possibly also the first week of Sept.). Call (505)425-5703 or write to: David Martinez, 430 So. Pacific, Las Vegas, New Mexico, 87701. Very reasonable.

FOR SALE: Right tent trailer. Sleeps four. Lightweight (750 lbs) with soft top. \$350. Dave Brocker, 377-9345.

NASA

National Aeronautics and
Space Administration

Ames Research Center
Moffett Field, California 94035
AC 415 965-5000

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The Astrogram

VOLUME XIX

NUMBER 4516

May 16, 1977

"The Bond that Binds" U.S. Savings Bonds Of Grants and Grasshoppers

It was a slow roller just past the Little League shortstop and out into left field. The left-fielder ran in for an easy interception, then stopped abruptly while the ball trickled off his shoe.

After two runs had scored, the center-fielder flipped the ball back into the infield before storming his paralyzed teammate. "What's wrong with you," he demanded! The frozen left-fielder remained staring at the ground and only whispered his simple explanation: "Look!" he marveled, pointing at the first grasshopper he had ever seen.

Now maybe that grasshopper was more important than that game. Or maybe it wasn't. What really matters is how we lose track of things when we take our eye off the ball.

Consider the cost of college. While we've been looking elsewhere, college costs have doubled in this decade and are almost certain to increase 100 percent in the next few years.

Full undergraduate scholarships are now reserved for a few disadvantaged students and athletic awards are thinning so fast many ball-players will see more grasshoppers than grants at college time.

To see how these facts might apply to your family's educational aspirations, let's look at two examples:

Suppose our Little League left-fielder was unusually bright. His family could assume he would win a scholarship to an expensive college. But when college time came, he would go without a grant because his family made good money and there would be too many girls and boys with smaller resources on the school's scholarship list.

Because his family counted on college without really planning for it, our left-fielder would take a part-time job on campus, his father would take a high-interest loan and his mother would go back to work.

On the other hand, suppose our center-fielder had a different story. His family would keep their eyes on the ball and save for his "scholarship" by buying U.S. Savings Bonds in his name when he was still too young to hold a bat. From the safest saving plan they could put money into, his scholarship account would earn 6 percent guaranteed annual interest.

The father, as beneficiary rather than co-owner, would file Bond interest as his son's income at the end of the first tax year. This would establish "intent," so no further returns would be needed for a "tax-free" education plan — unless his income should exceed his exemption total.

From more modest family earnings, this Little Leaguer would grow up able to live on the campus of his choice and earn his degree. He wouldn't have to work during the school year, nor borrow a cent.

Now you may have noticed that both of our stories had a moral. But remember: Only one had interest.

Dr. Mark states "I've been buying them forever"



Dr. Hans Mark, Center Director, pledges full support of Savings Bonds Campaign to Judith Bergland, Center Savings Bonds Campaign Manager and Coordinator.

Facts about Series E Savings Bonds

Series E is an appreciation Bond that is purchased at a cost of 75 percent of face value. Denominations (face value) available are: \$25, \$50, \$75, \$100, \$200, \$500, \$1,000, and \$10,000. The interest accrues at the rate of 6 percent when held to maturity of 5 years.

1. **Safe-Indestructible** — Savings Bonds provide maximum safety. The full faith and credit of the Federal Government stands behind them. Any Bond lost, stolen or destroyed will be replaced at no charge, at original issue date.

2. **Liquid** — You may cash an E Bond at any time beginning two months after date of issue. But to get the maximum yield of 6%, it must be held to maturity, 4-1/2% the first year.

3. **Guaranteed Rates — Automatic Extension** — Since December 1, 1973 the guaranteed interest rate is 6% when the Bonds are held to maturity. E Bonds now on sale are guaranteed a 10-year extension beyond first maturity of 5 years. (E Bonds of earlier issues have been granted additional extensions, so that all E Bonds still outstanding continue to earn interest.)

4. **Convenient to Buy** — The Payroll Savings Plan permits Savings Bonds to be purchased on a partial payment plan; an automatic, convenient way to buy bonds. You sign for a payroll deduction and watch your savings grow.

5. **Tax Benefits** — Interest on Savings Bonds is exempt from all state or local income or personal

property taxes. Interest from Savings Bonds is subject to Federal income taxes, but the tax may be deferred until Bonds are cashed or mature.

6. **Exchange Privilege** — Series E Bonds, whether matured or unmatured, may be exchanged (in amounts having a current redemption value of \$500 or more) for current-income Series H Bonds, which pay interest each six months by Treasury check and mature in 10 years. Freedom Shares are also eligible for this exchange, either by themselves or in combination with E Bonds. Accrued interest of the Bonds/Shares offered in the exchange continues to enjoy tax deferral until the H Bonds so acquired are redeemed or reach final maturity.

7. **Choice of Registration** — E Bonds may be issued in the name of one person, in the name of two persons as co-owners, or in the name of one person as owner with a second person as beneficiary (payable on death).

8. **Not Subject to Probate** — Savings Bonds issued with a surviving co-owner or beneficiary do not form part of an estate for probate purposes. However, their value must usually be included in computing the gross estate for estate and inheritance tax purposes in accordance with the laws of individual states.

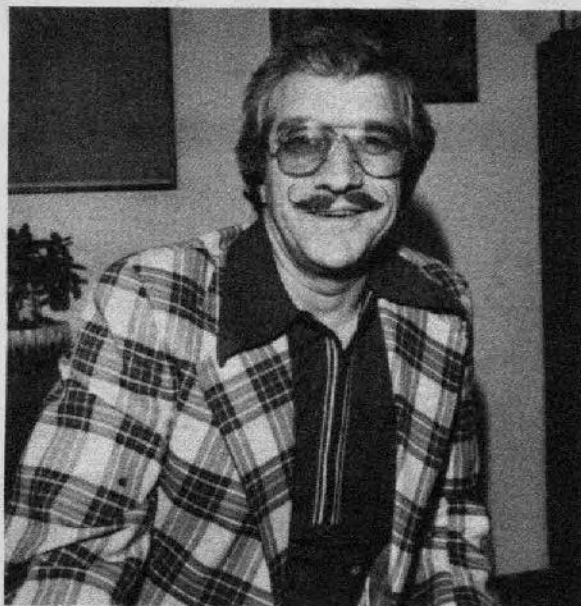
9. **No Market Fluctuation** — No need to refer to the market pages to see whether Savings Bonds are up or down. They are never worth less than you paid.

Are your family and country worth five minutes of your time?

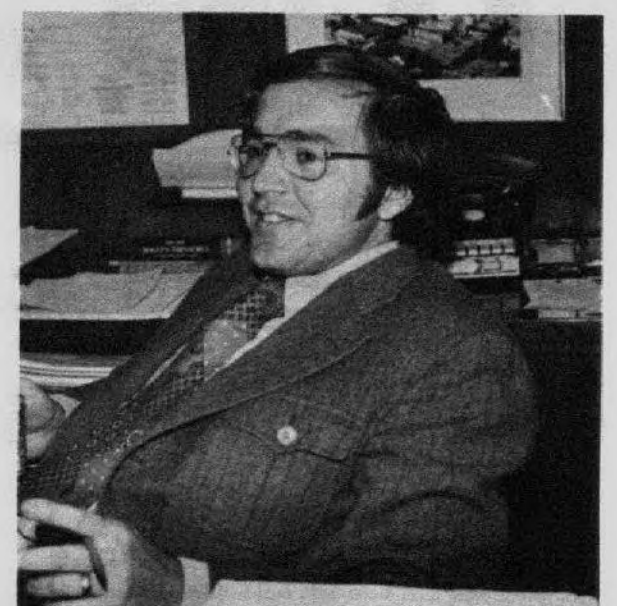
These Ames employees think so.



Mary Hall: "Easy way of forced savings. You don't miss the money if it is not there. I save for my children's future."



Sam Pitts: "Been saving for at least 10 years. It's a painless way to save."



Al Chambers: "Because Al Hertzog caught me two years ago and I never bothered to cancel them."



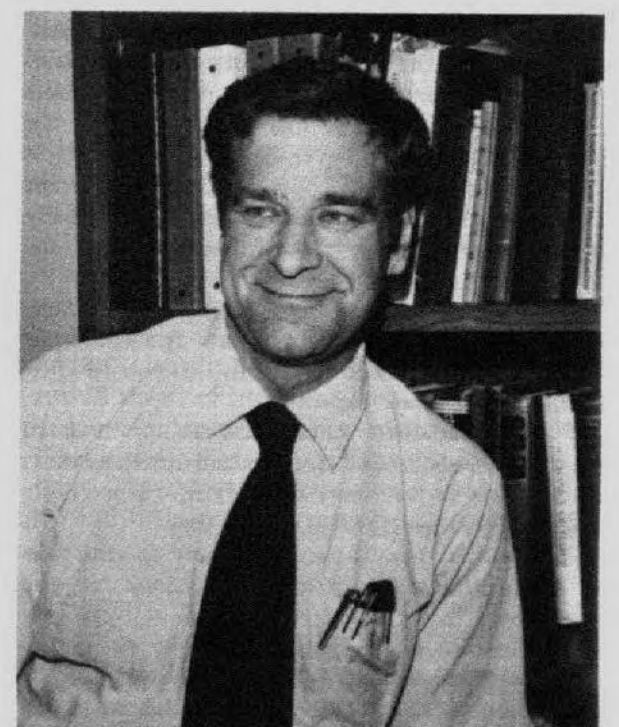
Doris Eason: "I enrolled in the Savings Bond Program several years ago as a convenient way to save for my children's future."



Take stock in America.

Buy U. S. Savings Bonds

Now E Bonds pay 6% interest when held to maturity of 5 years (4 1/2% the first year). Bonds are replaced if lost, stolen or destroyed. When needed, they can be cashed at your bank. Interest is not subject to state or local income taxes, and federal tax may be deferred until redemption.



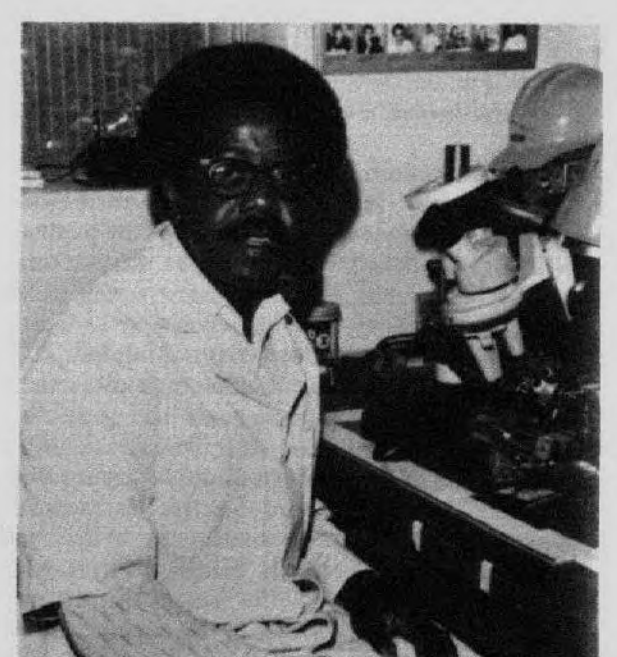
Ed Huff: "I think they help as an economic stimulus for the country."



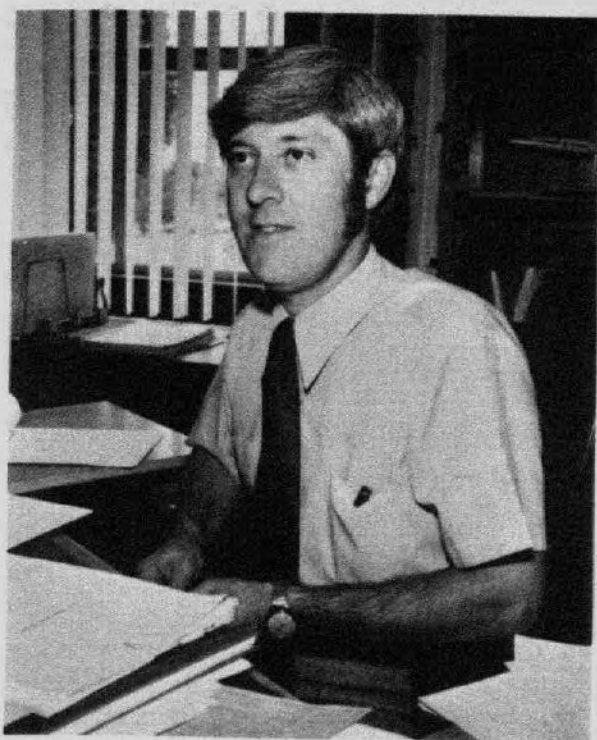
Louise Mahaffie: "Easy way to save because it comes directly out of my paycheck. It will help toward my retirement."



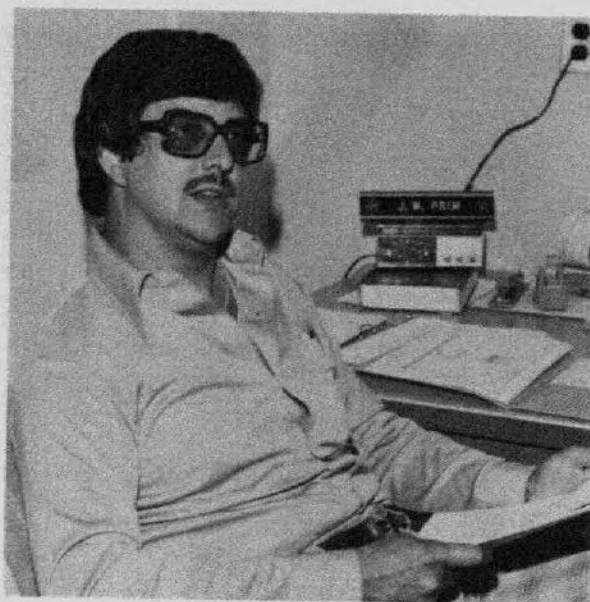
Vern Gnos: "Saving them for our trip to Europe. They are also a convenient way to save."



Lew Turner: "It is a good way for me to save. Cash is readily available whenever I need it. I also save for vacations." Taking them for about 20 years.



Bob Showman: "It's one great way of never seeing the \$!"



Jim Prim: "I am buying them for my children's education. They are in my children's name and are a gift to them for their education." Taking them for 17 years.



Helen Drew: "After 24 years of government service, I signed up for Savings Bonds and will continue to do so."

U.S. Savings Bond Participation

DIVISIONS & OFFICES

Code	Organization	No. of people in Division	Leader	Percentage* Participation
A, D, F, L, R, S	Leadership	45	Mark	69
AC, AR, AU, DE, DI, DL, DM, DP, DS, RI, RM, RQ, SC	Offices	81		69
FV	V/STOL Aircraft Tech	43	Deckert	83
FA	Aerodynamics	103	Petersen	81
FS	Flight Systems	121	Snyder	80
ST	Thermo- & Gas-Dyn.	140	Peterson	76
SE	Airborne Missions	60	Knutson	75
AA	Services & Supply	32	Reynolds	75
SA	Pioneer	59	Hall	71
RF	Research Facil. & Instr.	177	Giovannetti	70
AP	Personnel	36	Pike	69
LM	Man-Vehicle Sys. Res.	22	Chambers	68
SP	Space Projects	38	Nunamaker	68
AT	Technical Information	32	Bennett	68
AF	Financial Management	40	Shawlee	67
RK	Computation	64	Dines	67
SS	Space Science	79	Compton	66
RS	Technical Services	177	Stollar	65
FL	Simulation Sciences	45	Rathert	62
AS	Procurement	55	Walsh	54
FO	Aircraft Operations	62	Reese	53
LX	Extraterrestrial Biology	44	Billingham	52
LB	Biosystems	30	Johnson	50
LR	Biomedical Research	40	Sandler	47



Al Hertzog, past Bond Drive Chairman: "I've been saving Bonds since 1950 — when my daughter was married, I cashed a lot of them in and started over again. I like them because you don't have to pay income tax on the interest. I'll cash them in after I retire, most likely."



Annette Laboy: "Yes, I save Bonds ... for my daughter's education or for anything she wants to use them for in the years ahead. I put them in her name — she even has a social security number since age 2."



Eva Pegot: "I save for my children's education. My boy is eight and I hope to be retired by the time he starts college. I take bonds for his college education."





**Help
an old lady.**

Buy U.S. Savings Bonds.

58D-696

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Moffett Field, California 94035

NASA

The Astrogram

VOLUME XIX NUMBER 17

May 20, 1977

State of Center Address

On Monday, May 23, Center Director Hans Mark will deliver his annual State of the Center Address. In order to accommodate all of the people working at Ames, the presentation will be made several times during the day.

Please consult the following schedule to determine when your organization is scheduled to attend.

Organization	Code
A	8:15 a.m.
D	8:15 a.m.
F	9:30 a.m.
L	8:15 a.m.
R (except RK)	1:00 p.m.
RK	9:30 a.m.
S	10:45 a.m.
T, U, W, X, Y, Z	8:15 a.m.

Energy Conservation Expo

"A Day-Long Adventure Into the New Energy Concepts of Today and Tomorrow" is the theme for the Energy Conservation Expo to be held June 4 at De Anza College. The Expo is being sponsored by De Anza and West Valley Colleges, Pacific Gas and Electric Company, Lockheed Missiles and Space Company, and the Lockheed Management Association. Colonel Alfred M. Worden, former Ames Applications Division Chief and Apollo 15 astronaut, will be the keynote speaker.

The Energy Conservation Expo deals with the realities of the impending energy shortages, their impact on our economy and life styles, and the need to adopt a National Energy Plan NOW!

LEARN the basic facts about energy consumption trends . . . What energy sources are vanishing . . . Prospects for developing new energy sources . . . How to close the gap between rising energy consumption and dwindling natural resources.

SEE exhibits of new energy and water conservation techniques . . . Equipment and devices that will help in the near future to maintain living standards in the face of inflation and rising energy costs.

HEAR prominent energy authorities and policy spokesmen at federal, state, and local levels project the energy situation to year 2000 and debate long-term alternative approaches to meeting our needs and sustaining national growth.

Energy Conservation Expo brings together in lecture, films, and exhibits a balanced picture of major industrial, governmental, environmental, and conservationist viewpoints. The goal is to identify common ground for decisions and actions. Find out what you can do as an individual in your home, at work, and throughout the community to implement solutions to the energy crisis.

Galileo Scholarship Finalists



1977 AIAA/ARC Galileo Memorial Scholarship Finalists and Selection Committee. Front (l to r.): John Belliveau, James Johnsen, Richard Dick, Randall Brynsvold, Cynthia Smith. Middle: Patricia Lum, Richard Lender. Back: Louis Haughney.

James Johnsen, senior at Monta Vista High School in Cupertino, was selected winner of the 1977 Galileo Memorial Scholarship valued at \$750. He is planning to major in pre-medicine at Stanford University.

The other finalists received \$100 Savings Bonds. Their names and planned college majors are:

John Belliveau, Woodside Priory School, Portola Valley; Cal Tech, physics.

Randall Brynsvold, Willow Glen High School, San Jose; University of Santa Clara, physics.

Richard Lender, Cubberley Senior High School, Palo Alto; Stanford University, chemistry.

Patricia Lum, Henry Gunn Senior High School, Palo Alto; University of California at San Diego, biochemistry.

All the finalists received their awards from departing Ames Director, Dr. Hans Mark, at the May 5th Section meeting. Following the ceremonies, Prof. Arthur E. Bryson, Jr. of Stanford University spoke on "The Fascination of Fluid Flow" and showed a movie illustrating the effects of surface tension.

Members of the Scholarship Committee this year in addition to the Chairman, Mamoru Inouye, included Wayne Hinthorn, announcements; Paul Kutler, applications; John MacKay, trust fund; and Richard Dick, Louis Haughney, and Cynthia Smith, who comprised the Selection Committee.

Buy

U.S. Savings Bonds



Breakfast highlights Secretaries' Week 1977 SPINOFF



"Great speaker" ... "good food" ... "let's do it annually" ... these were the typical comments following the Secretary/Executive Breakfast held at the Ames Cafeteria Tuesday morning, April 26. The sell-out crowd of 355 people enthusiastically enjoyed Dr. Robert Dyer's suggestions for an effective secretary-boss team effort based on "real communication."

A special highlight for the 175 Ames people in attendance was the presentation of the Ames Secretarial Awards. Dr. Hans Mark took great delight in presenting the awards, in one of his last official functions before leaving Ames as our Center Director. The secretarial awards were presented on the basis of letters of nomination submitted by the bosses, and a committee selected three secretaries to receive the awards: Doris M. Furman, Uldine L. Kersten, and Nadine T. Omlid. Recognition of the profession of "secretary" as a worthwhile and meaningful career was an underlying reason for the observance of Secretaries Week with the Breakfast, and the presentation of the awards acknowledged the contributions made by the three award winners.

The breakfast was cosponsored by the Mission Trail Chapter of the National Secretaries Association and the Ames Women's Advisory Group. Ames was extremely pleased to have the NSA members, fellow secretaries, and their executives as guests for the breakfast, the program, and the tour of Ames. The Women's Advisory Group worked directly with the NSA Chapter in planning the breakfast, and it is hoped such a gathering and presentation of secretarial awards can become part of the observance of Secretaries Week each April. The Planning Committee extends sincere thanks to everyone who came and made the event such a great success.

Basketball champs



The Beer Barrels have won the All-Ames Basketball League Championship for an unprecedented fifth consecutive year. Six of the players have played on all five championship teams. Back row (l-r) Mladen Chargin, Frank Steinle, John Felter, and Larry Olson. Front row (l-r) Paul Soderman, Jim Myers, Mike Green, and Ken Johnson.

The 1977 SPINOFF has arrived! It is a continuation of the 1976 NASA Annual Report. Featured in this new SPINOFF are articles pertaining to the Space Shuttle, Tech House, and new technology in the areas of medicine, recreation, and industry. If you would like to receive a copy, you may contact the Technology Utilization Office by mail (240-2).

Solar "Hot Air" system

On Monday, May 23rd, at 11:30 a.m. in the Space Sciences Auditorium, Bldg. 245, Ames ACES will have the opportunity to hear about a Solar "Hot Air" system which has been designed to fully heat a house without auxiliary back-up power.

Dr. Ken Lennon will discuss this system which has been designed to use simple "Hot Air" collection and a rock storage heat sink to heat a house. Ken will also provide information on locally accessible sources of Solar information. A steering committee will be formed to set up programs for future meetings and activities based on the interests of ACES members. The meeting is open to all who are interested in learning about the status, availability and practicality of Alternate Consumer Energy Sources.

Safety corner

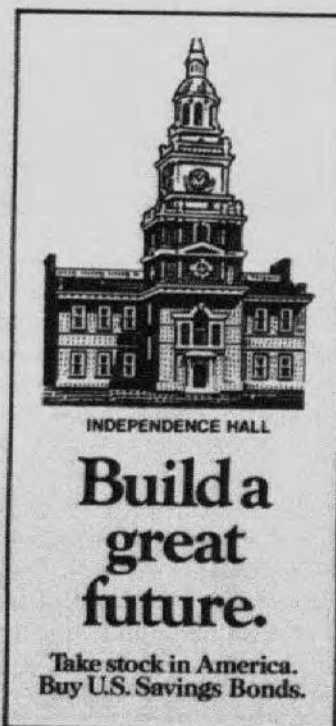
According to information received from John Habermeyer, Safety Officer, over 60 Ames employees gave their families a safer home by purchasing and installing smoke detectors — have you ordered yours yet?

Safety belts

The following reminder is an excerpt from the NASA Safety Standard for Motor Vehicle Safety Belts NSS/MV-1740.2:

Safety Belts: All occupants of a U.S. Government motor vehicle that is equipped with lap and shoulder safety belts shall properly adjust and wear both of them while operating or riding in said vehicle. It shall be a violation of this safety standard to remove, disable, or physically circumvent the proper use of lap and shoulder safety belts that are presently installed.

A copy of the entire Safety Standard can be obtained from the Ames Safety Office, Mail Stop 201-7.



12 excuses not to buy bonds

JANUARY — I can't save now, I'm still paying for Christmas.

FEBRUARY — This month's too short — and so am I.

MARCH — It took my last dime just to pay taxes.

APRIL — Easter outfits are all I can afford.

MAY — I'm still paying for Easter.

JUNE — I need every cent for my summer vacation.

JULY — Who saves on vacation?

AUGUST — It's too hot.

SEPTEMBER — Too many school expenses.

OCTOBER — Not now, I'm still paying for school.

NOVEMBER — I need every penny for Christmas.

DECEMBER — Who saves money at Christmas time?

When you're looking for excuses not to save, it's difficult to tuck any money away for bad times or peace of mind. "If only I made more money," you say — as if big salaries made savers out of spenders.

But suppose there was some way to turn things around, some way to find an excuse for systematic saving. What if you had a goal worth achieving? A special trip might be your excuse to save. If so, you should decide how much money you'd need, and exactly when you'd be taking your trip.

Then you should find some excuse to pay yourself first. You wouldn't want to wait until all your bills were paid and your living costs were covered. You'd want to take your saving right off the top.

The best excuse for saving would be some sort of payroll plan, a simple gateway to financial security — that opened automatically. Then you could simply tell your employer to withhold a certain amount from each paycheck and buy you some kind of bond, or a part of a bond, or several bonds.

Then right away, this money you wouldn't have seen could begin to make more money. Suppose you could hold this bond for five years and get a 6 percent annual interest and it would be the safest savings plan you could put money into.

What if the interest wasn't taxable until you cashed the bond? And even then, you could plan your investment so the tax bite would be reduced. Suppose you could cash your bond anytime before maturity and still get whatever interest you had coming at the time.

Wouldn't that be perfect?

Top management supports bond drive



Leaders of the 1977 Bond Drive include division and office chiefs such as those pictured above: Front (l-r) P. Tunnel, J. Giboney, D. Reese, T. Dines, A. Laboy, L. Colin, A. Giovanetti, D. Dennis, C. Syvertson, F. Lawrence, J. Glazer. Back (l-r) G. Rathert, R. Cooper, K. Reynolds, R. Pike, F. DeMuth, R. Nunamaker, L. Hughes.



Pledging their support of the 1977 Savings Bond Campaign are: Front (l-r) J. L. Jones, D. Brekke, M. Smith, W. Deckert, V. Peterson, J. Bergland, M. Knutson. Back (l-r) P. Bennett, K. Tomberlin, W. Peterson, L. Stollar, C. Hall, L. Bright, C. T. Snyder, D. Peterson.

10 good reasons to own bonds

1. Savings Bonds provide *maximum safety* of investment — they are backed by the full faith and credit of the federal government.

2. Interest rates are *guaranteed to maturity* — you can never get back less than you pay in. Interest may be increased, but not decreased. And rates are now higher than ever.

3. Bonds are friends in need. They are *liquid assets* which may be cashed after a minimal holding period — two months for E Bonds; six months for H Bonds.

4. Bonds are "*indestructible*." Any Bond lost, stolen, mutilated, or destroyed will be replaced at no charge. A record of each Bond sold is maintained by serial number and name of owner.

5. Choice of *registration* — Bonds may be issued in one name only, in the names of two persons as co-owners or in the name of one person, with a second person as beneficiary (payable on death).

6. Bonds are *convenient to buy*. The Payroll Savings Plan — in operation by numerous firms and governmental agencies — permits Savings Bonds to be purchased on a partial payment plan. Bonds may also be purchased on the Bond-a-Month Plan offered by many banks.

7. *Tax benefits* — Interest on Savings Bonds is exempt from all state or local income or personal

property taxes. Interest is subject to federal income tax, but the tax on E Bond interest may be deferred until the E Bonds are cashed or reach final maturity. H Bond interest, paid semiannually by Treasury check, must be reported annually for federal income tax purposes.

8. *Exchange privilege* — Series E Bonds may be exchanged for current-income H Bonds. Federal income tax on accrued E Bond interest may continue to be deferred until the H Bonds are redeemed or mature.

9. *Not subject to probate* — Savings Bonds issued with a surviving co-owner or beneficiary do not form a part of an estate for probate purposes, but their value must usually be included in computing the gross estate for estate and inheritance tax purposes, in accordance with federal laws and those of individual states.

10. *Prudence and patriotism* — Buying Savings Bonds helps the government manage the national debt in the most non-inflationary manner and helps finance programs and projects vital to our individual and collective well-being. Today's Savings Bonds dollars are used to pay for many programs and projects designed to improve our environment and raise our standard of living, including housing, education, transportation, health.



GEMINI
may 22-june 21

The intellectual, intuitive, charming, gregarious Gemini is emotionally tied to the need for a nest egg because it represents freedom, and travel, which you must have at all costs. The sure and convenient way to create one is with U.S. Savings Bonds through the Payroll Savings Plan.

PAYROLL SAVINGS ALLOTMENT OPTIONS

IT'S EASY TO SPEED UP YOUR RATE OF SAVING

\$ 25 Bonds — you pay \$18.75

\$ 1.25 for 15 pay periods
 \$ 3.75 for 5 pay periods
 \$ 6.25 for 3 pay periods
 \$18.75 for 1 pay period

\$ 50 Bonds — you pay \$37.50

\$ 2.50 for 15 pay periods
 \$ 3.75 for 10 pay periods
 \$ 7.50 for 5 pay periods
 \$12.50 for 3 pay periods

\$ 75 Bonds — you pay \$56.25

\$ 3.75 for 15 pay periods
 \$ 6.25 for 9 pay periods
 \$11.25 for 5 pay periods
 \$18.75 for 3 pay periods
 \$56.25 for 1 pay period

\$100 Bonds — you pay \$75.00

\$ 5.00 for 15 pay periods
 \$ 7.50 for 10 pay periods
 \$12.50 for 6 pay periods
 \$15.00 for 5 pay periods
 \$18.75 for 4 pay periods

If You Now Save	And are Receiving	In this No. Pay Periods	Increase your Allotment by	And Receive	In this No. Pay Periods
\$ 3.75	\$ 25 Bond	5	\$2.50	\$ 50 Bond	6
\$ 6.25	\$ 25 Bond	3	\$1.25	\$ 50 Bond	5
\$ 3.75	\$ 50 Bond	10	\$2.50	\$ 50 Bond	6
\$ 6.25	\$ 50 Bond	6	\$1.25	\$ 50 Bond	5
\$ 7.50	\$ 50 Bond	5	\$3.75	\$ 75 Bond	5
\$11.25	\$ 75 Bond	5	\$1.25	\$100 Bond	6
\$ 5.00	\$100 Bond	15	\$1.25	\$100 Bond	12
\$ 7.50	\$100 Bond	10	\$1.88	\$100 Bond	8
\$ 9.38	\$100 Bond	8	\$3.12	\$100 Bond	6
\$12.50	\$100 Bond	6	\$2.50	\$100 Bond	5
\$15.00	\$100 Bond	5	\$3.75	\$100 Bond	4
\$18.75	\$100 Bond	4	\$6.25	\$100 Bond	3

Bonds are for
making retirement
easier.



History of U.S. Savings Bonds

United States Savings Bonds, so named, have actually been on sale since 1935. Introduced by Treasury Secretary Henry Morgenthau, Jr., as a means of encouraging broad public participation in government financing by making federal bonds available in small denominations, they were specifically tailored for the non-professional investor.

While Treasury bonds had been offered for purchase by individual citizens at various times in our history dating back to 1776, they had always before been marketable securities, subject to fluctuation.

Many small savers, particularly buyers of Liberty Bonds during World War I, had experienced unexpected loss when forced by personal circumstance to sell their bonds in the market prior to maturity.

The Savings Bond was designed to make it impossible for any purchaser, however lacking in financial experience, to suffer loss under any conditions. It was offered as a savings type of bond with a schedule of fixed redemption values, redeemable at any time after a short holding period; it was issued in registered form (non-negotiable), and could be replaced in the event of loss or destruction.

Accumulated Value of E Bonds

At End of: (Years and Months)	Value of Bonds Through Monthly Investment of:			
	\$18.75	\$37.50	\$56.25	\$75.00
0-6	\$ 113	\$ 226	\$ 339	\$ 451
1-0	228	456	684	912
1-6	346	692	1,038	1,384
2-0	467	934	1,402	1,869
2-6	591	1,183	1,774	2,365
3-0	719	1,438	2,156	2,875
3-6	850	1,699	2,549	3,398
4-0	984	1,968	2,952	3,937
4-6	1,123	2,245	3,368	4,491
5-0	1,266	2,532	3,799	5,065
5-6	1,418	2,836	4,255	5,673
6-0	\$1,575	\$3,149	\$4,724	\$6,299
6-6	1,736	3,472	5,208	6,944
7-0	1,902	3,804	5,706	7,608
7-6	2,073	4,146	6,219	8,292
8-0	2,249	4,498	6,747	8,996
8-6	2,431	4,861	7,292	9,722
9-0	2,617	5,235	7,852	10,470
9-6	2,810	5,620	8,430	11,240
10-0	3,008	6,016	9,024	12,033
10-6	3,212	6,425	9,637	12,850
11-0	3,423	6,845	10,268	13,691
11-6	3,639	7,279	10,918	14,558
12-0	3,863	7,725	11,588	15,450
12-6	4,092	8,185	12,277	16,370
13-0	4,329	8,658	12,987	17,317
13-6	4,573	9,146	13,719	18,292
14-0	4,824	9,648	14,472	19,297
14-6	5,083	10,166	15,249	20,331
15-0	5,349	10,699	16,048	21,397

Note: Amounts have been rounded to nearest dollar. This accounts for any variation in multiple values.

Participation by NASA Installation and Directorates

NASA INSTALLATION

Installation	No. of Employees	No. of E Bond Buyers	Percent Participation
Kennedy	2,270	2,006	88.4
Langley	3,201	2,710	84.7
Wallops	425	342	80.5
Natl. Space Tech. Labs.	65	50	76.9
Johnson	3,935	2,841	72.2
Ames	1,649	1,148	69.6
Lewis	3,093	2,105	68.1
Headquarters	1,606	1,081	67.3
Marshall	4,408	2,839	64.4
Dryden	520	332	63.8
Goddard	3,783	2,167	57.3
NASA Wide	24,955	17,621	70.6

DIRECTORATES

Code	Organization	No. of People	Director	Percent Participation	
				1976*	1977**
D	Director's Office	46	Mark	95	78
A	Administration	217	Brennwald	76	66
F	Aeronautics	380	Roberts	75	74
L	Life Sciences	142	Klein	54	52
R	Research Support	440	Bright	72	67
S	Astronautics	400	Chapman	69	69

*Percentage at close of 1976 campaign.

**Percentage at start of 1977 campaign to be updated weekly.

Based on installation semiannual reports as of December 31, 1976.

Tips for official travel

NASA employees visiting other Government agencies or contractor facilities in connection with the receipt of classified information are reminded of the following:

1. One copy of the official travel orders will be sent to the Security Office, APS:241-2 for processing.
2. The Security Office will transmit the required information to the visited facility in advance of the visitor's arrival.
3. The travel orders must be received sufficiently in advance to permit expeditious processing.
4. The travel orders must indicate the date(s) of visit, purpose, and person(s) being visited (including phone number if known).
5. A note requesting visit authorization intermittently for a period up to one year is normally acceptable.

Also, all employees on official overseas travel orders must submit two copies of the travel orders to the Security Office in advance of travel. Visits to communist-bloc countries require extra processing, and the traveler will be contacted by the Security Office.

Additional information and assistance may be obtained from the Security Office at extension 5587.

Recycling center

As many of you know, Scout Troop 81 has been operating a Recycling Center, located in the parking lot behind Building 88 (the Laundry & Cleaners) at NAS Moffett Field. Last weekend, the Scouts mustered a painting crew and managed to get almost as much paint on the building as they did on the ground and each other. At any rate, it looks a whole lot better!

For those of you who don't know about the Center, the Scouts are recycling newspapers and aluminum cans and they would appreciate your support. There are two dump chutes for newspapers and one for aluminum cans, so that bundles or bags of papers and cans can be dropped off any time. And they are screening out bundles of shopping bags now to give to the Commissary.

So don't throw those papers and cans away, please! The only things they cannot take are magazines. Telephone books are OK, and any other form of paper (manuals, forms, etc.) — papers can be boxed, bundled, or bagged as well as loose. If you have a large collection of paper and no way to get it to the Recycling Center, call Roger Berg at 969-0955, or Keith Pritchard at 961-3668 to arrange for a pickup.

Stress management

The Stanford Heart Disease Prevention Program will broadcast "An Introduction to Stress Management" as a follow-up to the "Heart Health Test" which was shown in October. This one-hour video tape program includes a complete demonstration of a deep muscle relaxation technique that could be extremely valuable in reducing stress. It is hoped that this program will assist people in reducing tension in their daily life, possibly an important step in reducing the potential risk of cardiovascular disease.

The first showing of "An Introduction to Stress Management" was today, but it will be shown three more times at noon on May 27, June 3, and June 10, 1977. If you are interested in viewing this tape, please call the Training Office, extension 5622, to sign up.

Stanford T.V. courses

COURSES TO BE TELEVISED
SUMMER QUARTER 1977 OVER THE
STANFORD INSTRUCTIONAL TELEVISION NETWORK

AERO & ASTRO								
AA	133S	Laser Systems for Energy Transfer	MW	8:00-9:50	Ch. 12	ERL 320	Hansen	
AA	292S	Topics in Large-Scale Computer Applications	TTh	8:00-9:50	Ch. 12	ERL 320	Lomax	
ANTHROPOLOGY								
ANTHR	142	Social Identity: Ethnicity, Class and Sex	TTh	1:15-3:05	Ch. 12	ERL 320	Adler	
COMPUTER SCIENCE								
CS	111	Intro to Computer Organization, Machine & Assembly Languages	MTWTh	10:00-10:50	Ch. 3	SK 191	Franklin	
CS	135	Numerical Methods	TTh	10:00-12:00	Ch. 8	SK 193	Golub	
ELECTRICAL ENGINEERING								
EE	182	Digital Computer Organization	TTh	3:15-4:55	Ch. 3	SK 191	Staff	
EE	211	Principles of Pulse & Timing Circuits	MTWTh	11:00-11:50	Ch. 12	ERL 320	McWhorter	
EE	261	The Fourier Transform & Its Applications	MTWTh	2:15-3:05	Ch. 3	SK 191	Rosenfeld	
EE	381A	Switching Theory & Logic Design	MTWTh	11:00-11:50	Ch. 3	SK 191	Staff	
EE	611	The Microprocessor as a Circuit Component	TTh	1:15-3:05	Ch. 8	SK 193	Garland	(June 20—July 14)
EE	703	Space-Time Signal Processing	TTh	10:00-11:50	Ch. 10	SK AUD	Rockmore	
ENGINEERING								
ENGR	161	Engineering Economy	MTWTh	10:00-10:50	Ch. 12	ERL 320	Bhimjee	
INDUSTRIAL ENGINEERING								
IE	133	Industrial Accounting	MTWThF	8:00-8:50	CH. 8	SK 193	Bhimjee	
MECHANICAL ENGINEERING								
ME	299a	The Chemistry & Physics of Fires and Flames	MWTh	9:00-9:50	CH. 8	SK 193	Fristrom	(July 11—July 29)
ME	299b	Combustion Aerodynamics	MTWTh	9:00-9:50	CH. 8	SK 193	Chigier	(Aug. 1—Aug. 26)
OPERATIONS RESEARCH								
OP R	154	Operations Research	TTh	3:15-5:30	Ch. 8	SK 193	Avitzhak	
PHILOSOPHY								
PHIL	108S	The philosophy of Scientific Revolutions	MTWTh	1:15-2:05	Ch. 3	SK 191	Humphreys	

June 13 — Last day to sign up for televised classes.
June 21 — Instruction begins.

Call or stop by the Training Office, extension 5622, Bldg. 241, rm. 138, for further information.

Time Management for Secretaries

Time Management for Secretaries is a practical one-day course for secretaries which teaches strategies for: organizing and scheduling your time, dealing with procrastination, managing stress and change, coping with interruptions, developing effectiveness not just efficiency, and staying ahead of the game. If you are interested in attending this course, please call the Training Office, extension 5622, by June 10.

Thank you

Dear Friends at and from Ames —

Grace, Judy, Jan, and I thank you for the great luncheon send-off. I especially thank you for the golf woods which will remind me of you many times. To the Northrop simulation crew "thanks" for the signed plaque and "controller."

I enjoyed most of all working with you all.

Jerry Dickson

Bloodmobile

The American Red Cross Blood Mobile will be at Ames on June 8 between the hours of 8:30 a.m. and 1:30 p.m. in the Auditorium, Bldg. 201.

Ames Promotion Plan vacancies

Notice No.	Title	Grade	Org.	Area of Consideration	Closing Date
77-68	Aerospace Engineer (2 positions)	GS-13/14	FHI	Centerwide & Outside	6-6-77
77-69	Aerospace Engineer	GS-12/13	FHI	Centerwide & Outside	6-6-77
77-70	AST Technical Management	GS-13/14	FD	Centerwide & Outside	6-6-77
77-71	Aerospace Engineer	GS-12/13	FHI	Centerwide & Outside	6-6-77
77-72	AST Technical Management	GS-13/14	FD	Centerwide & Outside	6-6-77
77-73	Aerospace Engineer	GS-12/13	FHR	Centerwide & Outside	6-6-77
77-74	Aerospace Engineer (2 positions)	GS-12/13	FHI	Centerwide & Outside	6-6-77
77-75	AST Technical Management	GS-13/14	FD	Centerwide & Outside	6-6-77
77-76	Mathematician, AST Theoretical Simulation Techniques	GS-12/13	FLT	Centerwide & Outside	6-6-77
77-77	Aerospace Engineer	GS-7/9/11	FSV	Centerwide & Outside	6-6-77
77-78	Aerospace Engineer	GS-7/9/11	FSN	Centerwide & Outside	6-6-77
77-79	Aerospace Engineer	GS-12/13	FSN	Centerwide & Outside	6-6-77
77-80	Aerospace Engineer	GS-12/13	FSD	Centerwide & Outside	6-6-77
77-81	Aerospace Engineer	GS-7/9/11	FSD	Centerwide & Outside	6-6-77
77-82	Computer Specialist	GS-7/9/11	FSA	Centerwide & Outside	6-6-77
77-83	Secretary (Typing)	GS-5/6	FO	Centerwide & Outside	5-31-77
77-84	Contract Specialist	GS-12/13	ASF	Centerwide & Outside	5-31-77

TO APPLY: Call extension 5599 or 5600.

MERIT PROMOTION PLAN SELECTIONS

Notice No.	Title	Org.	Name
77-36	Administrative Specialist	FOR	Barbara Moorehead
77-39	Research Aircraft Inspector	FOI	Erwin Hess
77-42	Secretary (Typing)	FSV	Mildred Gordon (Outside Candidate)

Want ads Transportation

Truck — Toyota 1977 SR-5 Long bed, red, just purchased, 1700 miles, Blaupunkt AM-FM, etc., \$3975. Miles Murphy, (415) 776-8509.

1976 Triumph TR7, beautiful cond., Moon Roof, AM/FM 8-Track, Mags, Custom Stripe, only 17,000 miles. Transferable 50,000 mile warranty, current Blue Book price \$6650, asking \$5500. Will take partial trade. 961-9452.

'72 Pinto, AT, 2000 CC eng., exc. cond. \$1500. 965-4031.

VW '71 Bus, 9 pass., great cond., in/out. Tires like new. AM/FM radio. Needs engine rebuilt, \$1595 or best offer. Tel. 354-3453.

1967 Chevrolet Chevelle, good running condition, new tires and battery. Owner leaving area. Call 961-3804.

1972 BMW Bavaria 3.0, air, stick, new exhaust, almost new Michelins, 54K miles, clean, must see to appreciate, \$5200/best offer, 629-1362.

Housing

Apartment for rent, unfurnished: Univ. Ave., Palo Alto, Lux. 2 br, 2 ba, Pvt. wooded, AEK, dwshr, indiv. patio, W/G pd., undgrd. pkg., \$345, 493-9406.

House for rent: Saratoga, 3 br, double garage, 1½ bths, near Westgate Shopping Center. Bus to Ames. Exc. schools, large lot with large backyard. \$390 per mo. Call (415)747-0787.

For rent: 3 bdrm, 2 bth home. Unfurnished. Highlands of Los Altos. 2100 sq. ft. Family room. 2 fireplaces. ¼-acre lot with mature landscaping. 18 mo. or 2 yr. lease desired. Available 10 July. \$700/mo. (negotiable). Contact: (415)969-9675 or 966-3708.

FOR RENT: Eichler, immac. 4 BR., 2BA., fam. rm., fireplace, 2-car gar., AEK, dshwshr., disp., new no-wax floors, new cpts and drps, lovely private yards, prime Palo Alto location, close to schools, stores, and Ames. Lease \$525 mo. Call 964-1725.

Home for rent: 3 bedrooms, new kitchen, large storage area; Santa Clara near Lawrence & Stevens Creek. \$400 per mo.; available May 9. Call R. C. Whitten at 252-9213 after 5 p.m.

House for rent: Sunnyvale, 3 bdrm., 1 ba., double garage, fireplace, large yard w/patio and barbecue pit, lots of fruit trees, appliances, 3 miles to NASA. \$360 mo. 248-9733 or 734-2103.

For rent: Beach House at Pajaro Dunes (near Watsonville). Completely furnished, including linens; cleaning included in the rent; beautiful views of Monterey Bay, 100 ft from the beach; tennis courts. Reserve now for summer. Call John Lundell, 252-7260.

Miscellaneous

Learn to fly, club interest in Cessna 140, \$300, \$6 per hr rent, \$6 per month dues tied at No. 821, Palo Alto, Miles Murphy (415) 776-8509.

FOR SALE: 2 sleeping bags, rectangular with 3 lb. "Fiber Fill II" insulation. Used only a few times. 2 air mattresses, full length I beam, rubberized nylon. \$20. Perfect combination for luxurious car camping. 738-2948.

King size bedspread, excellent condition from the Vera collection. Fern design, brown and beige. \$30. Call after 5 p.m. 744-0520.

FOR SALE: Nikomat FT2 + 50-mm lens f2 and hard case. Almost new (8 mo. warranty) \$265. Call 967-7396.

FOR SALE: Beautiful solitaire diamond engagement ring with wedding band. ¾-carat, appraised at \$1,800, asking \$1,000 or best offer. Call Midge at 732-1641 after 4:00.

FOR SALE: Two HR78-14 Uniroyal steel belted radials, lots of tread left. Both for \$30. Call 244-4632 after 5 p.m.

SOCCER—Anyone interested in playing soccer at lunch time? Call Larry Ng or Tom Wynn at X6026.

Dinette chairs, set of 6, made of wood, drk. walnut color, with heavy duty vinyl seats. Impressive, very good cond. \$90. Call 321-1858.

Foam mattress, 30" wide, 4" thick, never used, \$15; sleeping bag, very little used, \$15; wall lamp, study lamp, v. good cond., \$10 ea. Call 321-1858.

All wool rug, 9x12, made in Ireland, pretty, colorful, like new, \$100. Call 321-1858.

NASA

National Aeronautics and
Space Administration

Ames Research Center
Moffett Field, California 94035
AC 415 965-5000

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Now E Bonds pay 6% interest when held to maturity of 5 years (4% the first year). Bonds are replaced if lost, stolen or destroyed. When needed, they can be cashed at your bank. Interest is not subject to state or local income taxes, and federal tax may be deferred until redemption.

The Astrogram

VOLUME XIX

NUMBER 18

June 2, 1977

HEAO-A launch

NASA's first High Energy Astronomy Observatory, HEAO-A, is scheduled to be launched about June 30 from the Kennedy Space Center, Florida, aboard an Atlas Centaur rocket.

The launch had been postponed from an earlier scheduled date, April 15, due to problems with the observatory's gyroscope package. The malfunctioning rate gyros were removed from the spacecraft at the launch site and returned to the supplier for failure analysis, corrective action and re-test. The function of the four gyros is to provide attitude control for the observatory.

HEAO-A will inaugurate a three-mission program to study some of the most intriguing mysteries of the universe — pulsars, quasars, exploding galaxies and black holes in space. HEAO-B and HEAO-C will be launched in 1978 and 1979.

The observatories — the heaviest unmanned Earth-orbiting satellites ever launched by the United States — will carry scientific instruments capable of detecting, with high sensitivity and resolution, X-rays emitted by stellar sources throughout the universe. Celestial gamma ray and cosmic ray data also will be collected.

The program is managed for NASA's Office of Space Science by the Marshall Space Flight Center.

Space Shuttle test flight

The first manned test flight of the Space Shuttle Orbiter scheduled for May 26, has been rescheduled for no earlier than June 9, 1977 at the NASA Dryden Flight Research Center. The exact date is dependent upon successful completion of Orbiter ground tests.

This flight begins the second phase of the Shuttle Approach and Landing Tests, a program designed to verify the aerodynamics and flight control characteristics of the Orbiter.

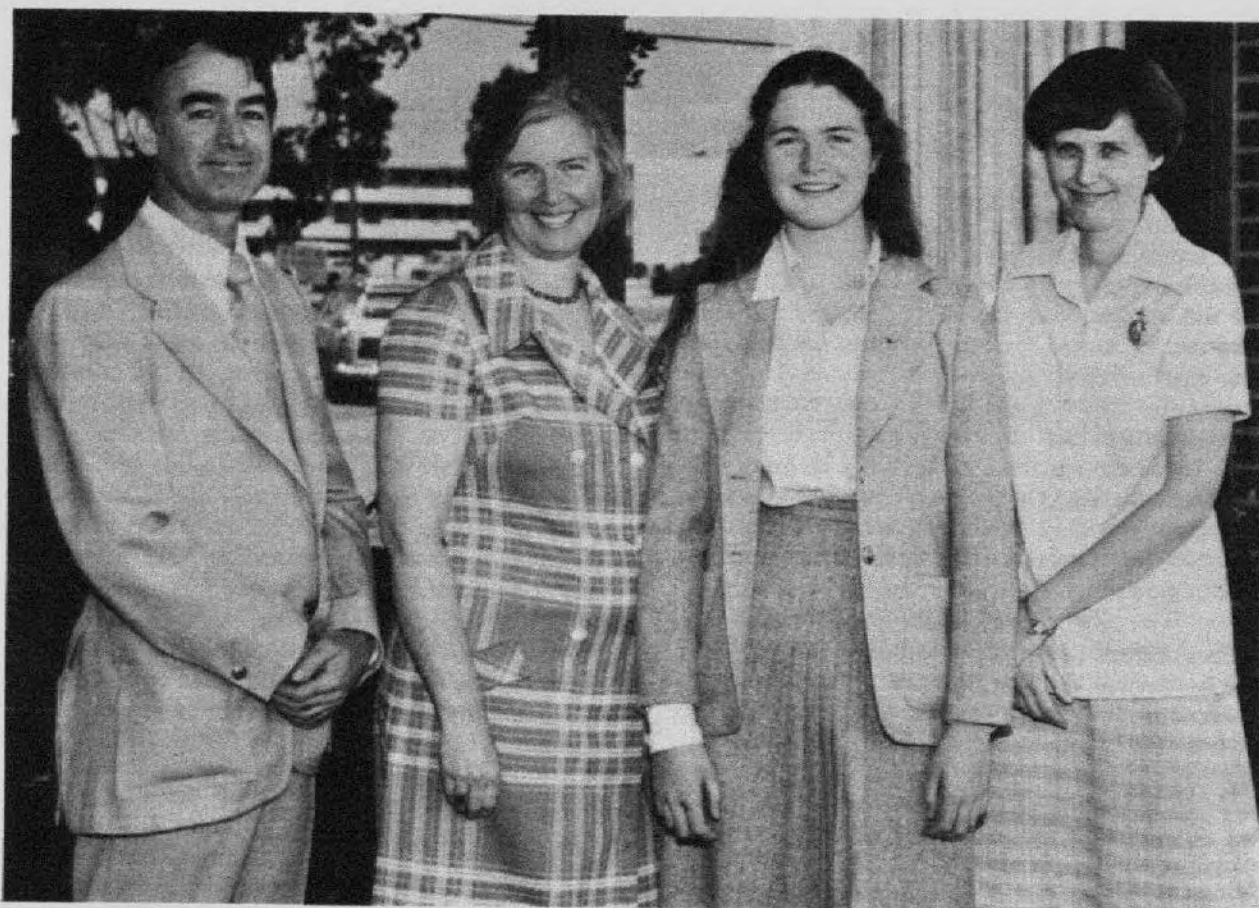
The postponement is due to delays in verification testing and systems checkout of the Orbiter following the first Orbiter/747 flights completed in early March.

Up-to-date status reports on Shuttle test flight activities at DFRC are available at (213) 354-4213 (Los Angeles) or (Edwards) at (805) 258-4474.

Tektronics Product Display Cruiser

The Tektronics Measurement Product Display Cruiser will be at Ames on June 16 at the following locations: Bldg. 213 — 8-12; Bldg. 247 — 1-4.

FPC Scholarship recipient



Theresa Munoz (center), daughter of Ames employee Robert Munoz (far left), was one of ten students selected this year to receive a Federal Personnel Council Scholarship Award (Northern California winners). Here she poses with her parents and her counselor, Sister Catherine (far right).

Theresa is a student at St. Frances High School in Mountain View. She is a life member of the California Scholarship Federation, a National Merit Finalist, and an active participant in school activities such as cross country and track athletics, speech club, journalism, etc. She is interested in Civil Rights and the study of either Law or Public Service. Theresa has been accepted to the University of California at Berkeley, but she has also applied to Harvard, Radcliffe, and Stanford.

NASA film wins award

The 10th Annual U.S. Industrial Film Festival has honored NASA's motion picture "Universe" this month with its Chairman's Special Award, "Best of Festival." The competition for this prize included 970 motion pictures from five nations. The three finalists were Smithsonian Institution's "To Fly," I.B.M.'s "Parade of the Tall Ships" and NASA's "Universe."

"Universe" produced for NASA by Graphic Films during 1977 has received a nomination for an Academy Award, won a CINE Gold Eagle rating, won a bronze medal at the 19th Annual San Francisco Festival and an award from the Golden Gate Festival.

It will represent the United States as an entry in scores of International Film Festivals during the year. The U.S. Industrial Film Festival in Chicago is rated as one of the five top U.S. film festivals.

Fuller Memorial Scholarship

A memorial scholarship fund has been established at San Jose State University in the memory of Franklyn B. Fuller who died Thursday, May 12, 1977, of cancer. Prof. Fuller was chairman of the Mathematics Department at San Jose State University. Prior to joining the San Jose State faculty in 1970, Dr. Fuller was a research scientist in the Theoretical Branch at Ames, where he had worked since 1947.

The scholarship fund will provide a yearly scholarship grant for an outstanding student with financial need, whose major is in mathematics at San Jose State University. Contributions in the form of checks payable to The Franklyn B. Fuller Memorial Scholarship may be sent to Bill Fox, Financial Aids Office, San Jose State University, San Jose, California 95192.

Annual Report to the Center

May 23, 1977

This is my last report to you as the Director of the Ames Research Center. It is, thus, a summing up for me of eight full and very exciting years. I hope you will forgive me, therefore, if I start by reminiscing.

We have had some interesting times together, and some moments of triumph, failure, and tragedy. I remember in the summer of 1972 when the Augmentor Wing C-8 first arrived at Ames. The C-8 is the first member of our new generation of experimental short-haul aircraft. Maybe there are some among you who remember how we all felt when we saw the airplane come up the Ames ramp for the first time. I personally believe that this event marked the beginning of the important program in aeronautics that we now have well underway. As you all know, things are still happening in this business, and just a few weeks ago on May 3, 1977, the Tilt-Rotor Research Aircraft flew for the first time at the Bell Plant in Fort Worth. There is little doubt in my mind that work done with these aircraft will have significant influence.

Another landmark was the day in January of 1971 that the decision was reached to bring the Illiac IV computer to Ames. I cannot honestly say that the Illiac itself has been an unalloyed success. The performance of the machine did not completely meet the expectations that some of us had for it. On the other hand, the existence of the Illiac at Ames did put the Center into the big time computer business. In the long run, that will have been the most important result of the existence of the machine here at the Center.

Then there is the unique series of discoveries that have been made with the Gerard P. Kuiper Airborne Observatory. Personally, I believe that this particular "facility" is definitely among the most productive scientific enterprises in the Country. There was the discovery of bound water on Mars in 1973, the analyses of compounds in the atmosphere of Jupiter in 1974, and most recently the discovery of rings around the planet Uranus.

Finally, I don't think that I will ever forget the night in December of 1973 when the first spacecraft, our own Pioneer 10, flew by the giant planet Jupiter. That was truly a unique event. I remember the high state of genuine excitement as the first pictures appeared on the flickering television screens in the control room over in building N-244. For a few hours we were at the very forefront of science and the very center of attention of the scientific world.

I know that there are many other incidents of the kind I described, but I simply don't have the time to list them all. I ask those of you who were involved in some that I have not been able to discuss to forgive me for not mentioning them here.

We have also had failures. I don't believe, for instance, that the rotating cylinder flap concept for Short-Takeoff and Landing Aircraft really ever worked out in a successful way. Another was the use of high altitude balloons for doing infrared astronomy. This project also failed after some very hard work by a great many people. I am sure I could also list a great many of these. I don't want to make excuses for failures, but I believe that it is important for an institution of this kind to occasionally do something that does not work. We must continue to take risks knowing that some of these projects will end up in our junkyard. I have always felt that if a laboratory of this kind has an empty junkyard, then people in it are no longer stretching their minds and using their imaginations to the limit.

There have also been administrative failures. Perhaps the most serious of these is that I have been unable to prevent a steady erosion of Civil Service complement at the Center. It has been the most difficult thing for me to watch this happen and to have the responsibility for carrying out these reductions in force. We also suffered some reverses in the discussions over the roles and missions of the various NASA Centers that have been actively going on for the past two years. The loss of the Pioneer Program was especially painful to me. On the other hand, I believe that we also gained some programs in the roles and missions adjustments, which in the long run will more than balance our losses, since the programs we gained probably have a stronger future than those that we lost. The firm decision to designate Ames at the lead Center for NASA's helicopter R&D efforts more than compensates for the losses. Finally, I would say that our relationships with Headquarters have not always been as good as they should be. To some extent this is, of course, inevitable because it lies in the nature of the relationship. Nevertheless, I hope that my successor will be somewhat better than I was at maintaining these ties.

I cannot make a list of things that were important without also including the tragic crash of the first Galileo. I remember that terrible night when we were informed of the accident on an airplane coming back from Washington. There were several Ames people on the same airplane with me, and some of you here may recall that fateful night. I also remember going to the funerals of all the men who perished in the accident. It was truly a heart-breaking experience. The important thing to remember, however, is that we recovered from this terrible setback. The Galileo II is flying, and the program for the airplane is now better than it ever was. Significantly, it also strengthened that sense of belonging, of community that is shared by all of us who work at Ames.

In summing up these things, I want to say a few words about the one program we have here which I believe will have the most important long-term impact. That work is, in my opinion, what we have done in the field of computational fluid mechanics. Fluid mechanics is at the very heart of the business that we are engaged in. Nothing can be done in aeronautics or in space without a deep and thorough understanding of that science. I am very proud that we have achieved a leadership position in computational fluid mechanics, and that we have been recognized as the most important scientific center in the nation in that particular field. I believe that all of us will be proud to say that we were at Ames at the time when this work was being done.

Let me now turn to the future. It has been my custom in these talks to present to you a rather detailed account of what I believe lies ahead for the Center. It would not be right for me to do this now, because I will no longer have the responsibility of implementing whatever I say here. Thus, I would like to talk about the future in more general terms and make some recommendations for the future of the Center. First, I believe that there is at least some reason for optimism regarding the future of aeronautical and space activities of the Nation. The new Administrator-designate of NASA, Dr. Robert Frosch, is an excellent man who understands technology, and who knows how to deal with potential customers for the kind of work that we do. In aeronautics I believe that short and vertical takeoff and landing technology will perhaps have somewhat more support in the future than it has in the past by the new NASA Administration. The military

requirements for new V/STOL vehicles will eventually force this support. Programs in earth observations, meteorology, and atmospheric sciences will, I believe, be greatly strengthened. Astronomy will also retain a high priority. Work in the biological sciences may see a revival because of the development of Spacelab. Unfortunately, I believe that planetary exploration will probably be less important in the future than it has been in the past. The fact that the House Appropriations Committee deleted the Jupiter Orbiter Probe from the NASA budget is perhaps a bad omen in that direction. We must do what we can to try to restore this important project to the NASA budget, but it is not clear to me at this time whether we will succeed. I also believe, and even expect, that NASA will be part of a planned government reorganization. This could have many consequences, depending on just how the reorganization is carried out, but I believe that the general effects of combining NASA with some other departments in the Federal Government might have beneficial consequences not only for the work the entire agency does, but for the Ames Research Center in particular.

I am firmly convinced that Ames has a strong future. The key to that future is that we have well defined customers for our work. It is of the utmost importance that we continue to make every effort to develop the closest possible relationship with our colleagues in the aeronautical community that must have the output of our efforts. The U.S. Army's Aviation Systems Command is, of course, the primary example. Ames has been in the lead in developing this particular relationship, and we must be most assiduous in nurturing and growing it in the coming years. Another example is the relationship that we have developed with the Federal Aviation Administration in executing the Aircraft Safety Reporting System. It is of the utmost importance, in my opinion, to see to it that this program continues and that the connection with the FAA is expanded. A third example is our work with the Pacific Northwest Regional Commission. This particular program has by any measure been most successful, and every effort should be made to strengthen and expand work of this kind at Ames. We may shortly have an opportunity to refurbish the large centrifuge to do earthquake research sponsored by the National Science Foundation. Should this opportunity arise in a realistic way, I believe that we should grasp it and develop it in the same way that we have taken other opportunities in the past. We must continue to make every effort to go to our customers and to try to persuade them to work with us in the closest possible collaboration.

Another basic issue is that we must see to it that we have the best physical facilities for work in those areas where we have chosen to lead. We have done this in the past, and our large computer complex, our modern simulation facility, and finally the new 40- by 80-Foot Wind Tunnel rebuilding program are the most outstanding examples.

I also believe that we must continue to take part in the process of clarifying the roles and missions of the various NASA Centers. I believe it is important for us to do this because support for research, development, and technology will not increase in the foreseeable future. Thus, the pressure for well defined roles and missions will continue, and we should help lead the discussions and, therefore, shape the situation according to our desires rather than let it be forced upon us. I recognize, of course, that well-defined roles will, in some sense, restrict our freedom to do what we want, but I believe that this is the price we must pay for continued survival as a healthy institution.

Annual Report

(Continued from Page 2)

In the past few minutes I have discussed in some detail the practical problems that NASA and Ames will face in the coming years. It is important, however, not to let concern with the practical situation entirely dominate our thinking. There is a quote from the Old Testament, I think it is in Deuteronomy, that I particularly like: "Man doth not live by bread alone, but by every word that proceedeth out of the mouth of the Lord doth man live." We must not think about practical things exclusively. We must remember that man has imagination and that we must follow it where it leads. Otherwise, we will ultimately lose our humanity. It is most important for us to remember that the very essence of our business is to formulate and to ask important questions. We must continue to do this. What is the origin of life? How do we finally break the strands that tie us to Earth and expand into the Universe? I am most proud that Ames has had an important part in activities surrounding these questions. In spite of the disappointment of not finding evidence of biological activity on Mars during the Viking Mission, we must continue to work in this area. The search for extraterrestrial life is crucial, and if possible Ames should retain a leadership role. We must continue to study the ability of man to live in space and our ability to construct habitats in space. Ames already has an excellent reputation for work of this kind, and we should make every effort to continue these activities, at least at some modest level.

I want to end this talk on a personal note. I will shortly be going to Washington. I am leaving because an old friend and a man for whom I have great respect, Dr. Harold Brown, has asked me to come to Washington and help out. There is, however, another reason why I felt that this is a good time to go. The fact is that the leadership of institutions such as this one must change reasonably often, otherwise stagnation occurs. It is important for new thoughts and new ideas to be introduced, and very often this cannot be done without changing the personalities responsible for the leadership of the institution. In my own case then, I do want you to know that in addition to the new challenge in Washington, I have come to the conclusion that a change in the leadership at Ames would also be for the best at the present time.

However, I also want you to know that I would like to come back to Ames, provided that the new NASA and Ames managements will have me. You might ask, Why? I believe that the Ames Research Center is the best federally funded laboratory in the Country. In the past decade I have had the good fortune to look in detail at many federal laboratories. I can assure you none is better than Ames. I have a commitment to spend four years in Washington. At the end of that time I will come back and join you in working on some of the very interesting and important technical things we will be doing at the time. I am particularly interested in the phenomenon of turbulence in fluids, and I want to start doing experimental work in that field. I remember Harvey Allen telling me once that that's what old fellows do when they are not good for anything else. Well, Harvey was right about most things, but not about this one. I honestly believe that when I return we will be on the threshold of some very important breakthroughs in our understanding of turbulence. The new optical and electronic sensing techniques that are becoming available assure that this will happen. In any event, that is my intention, and I would like you to all know what I want to do.

Ames is the best laboratory the Country has; please keep it that way. Good luck and Godspeed.

10,000 Mile Jogger



Ames employee, Art Mandell (left) is shown receiving a Jogger T-shirt from Dr. Lewis Hughes, Chief of the Health and Safety Office upon reaching the 10,000 mile mark in jogging.

Bailey / Ballhaus honored

Dr. William F. Ballhaus, an aerospace engineer with the Ames Directorate, U.S. Army Air Mobility Research and Development Laboratory, AVSCOM, and Dr. F. R. Bailey, and Ames engineer, each received the 1977 H. Julian Allen Award and a check for \$1,000 for coauthoring a scientific paper judged to be the best of the year. The presentation was made by Dr. Hans Mark during special ceremonies held in the Ames auditorium recently.

The paper is entitled "Comparisons of Computed and Experimental Pressures for Transonic Flows About Isolated Wings and Wing-Fuselage Configurations."

Dr. Mark took the occasion to comment on the success of the Army NASA association.

"First, I believe that the arrangement that we have developed between NASA and the Army is perhaps the most important administrative innovation that occurred during my term as Director. I believe that in an era where financial support for the kind of work we are doing will continue to decrease, we must make the best possible use of all our facilities and people. In my view, this can only be done by developing the kind of arrangements that we have worked out here.

It is quite obvious that we simply will no longer have the luxury to have each agency build its own R&D facilities, and it is of course that which makes it so important to share the resources that we each have.

"Second, I would like to say that you and the other people in the Army organization have done a really first-class job in forging an excellent research and development group. You have managed to hire a number of really outstanding young people, and you have provided them with an environment wherein they can do their best work. The most recent example of this is the award of the H. Julian Allen prize awarded jointly to Dr. F. R. Bailey and Dr. William Ballhaus. What is important about this award is that Dr. Bailey is a NASA employee and Dr. Ballhaus, an Army employee, and yet they were able to work together in a collaborative way so that an extremely important result was obtained. I believe that this collaborative work is excellent proof of the flexibility that we have built into the system here, and I hope and expect that we will be able to continue to work in this way in the future."

Surplus books

The Life Sciences Library, building 239 (basement) is preparing to surplus books no longer needed in the library or division library collections.

Before instituting formal surplus procedures, the staff wants to be certain that all local needs are being met; therefore, the items being surplus will be available for examination by Ames employees. They may select any title pertinent to their work for retention in offices or laboratories.

Stop by the Life Sciences Library B71 anytime beginning Monday, June 6th. The materials will be on display shelves in the hallway at the far end of the library outside Room B71.

Persons selecting materials are reminded that the material remains government property and may not be appropriated for addition to private libraries or collections.

Albacore fishing

The When, Where, How and Cost will be discussed about an Ames Albacore Fishing Trip on June 9th in the Space Science Auditorium at 12:00. We need a total of 30 persons so "Tell a Friend". Reservations will be on a first come first serve basis.

Photo club

Annual Ames Photography Club Banquet to be held at Moffett Field Officers Club on 17 June 1977: All NASA employees, contractors, students, and guest workers are cordially invited to attend. A no-host cocktail party starts at 6:30 p.m. Dinner will be served at 7:00 p.m. The entree will be veal cordon bleu. Coffee or tea, salad, and dessert are included. The cost per guest including gratuity is \$6.00. The selected winning color slides and prints of the year will be shown. Mr. Mike Ivanitsky of the Foothill College Photography Department will be the judge.

For reservations, contact any of the following Camera Club members: Norman Sherwood, Vernon Yearwood-Drayton, Don Reynolds, Paul Kovalak, Bob Eglington, Jack Ratcliff, and Jerry Barrack.

Want ads

Transportation

1967 Camaro, AT, PT, dxi trim, whl cov, 82K mi., 1-owner, xhnt cond. \$1,525. 263-3942.

1973 Chevrolet Impala P/B auto trans, P/S, A/C, \$2,000 or best offer. Available June 11. Must sell as returning to Australia. Phone 737-0589.

1970 Pontiac Ventura Package, AT, PS, PB, AC, 72K miles - \$1500. 998-6024 days - 225-3061 eves.

Truck - Toyota 1977 SR-5 Long bed, purchased 2 weeks ago, 1700 miles, Blaupunkt AM-FM, etc., \$3975. (Save about \$500) Miles Murphy, (415) 776-8509.

Buick Special, old, but nice shape and in running condition - \$250. 965-9750.

1976 Triumph Spitfire, has everything, 50,000 mile warranty, roll bar, overdrive, luggage rack, plus other extras, Must Sell, \$6,000/offer. Call after 5 p.m. D. Bosick 275-1257.

Housing

Two bedroom furnished condominium rental on Sandmound Slough in the Delta near Bethel Island. Covered boat berth. No water shortage for boating, plenty fish, skiing, fun. Weekend, week or month. Call (415) 965-0233 or (408) 356-6849.

Miscellaneous

FOR SALE: Electrical guitar, Gibson copy, hollow body, beautiful tone and appearance Gibson amplifier. Both for \$150. 738-2948.

FOR SALE: 1) Older radial arm saw complete with table and some blades, \$100; 2) 3/4 H.P. bench grinder hardly used, \$75; 3) Iron welding table, \$20; 4) Electrically wired work bench. \$20. Home phone 248-2419.

FOR SALE: Sears 19" color TV, table model. 1 1/2 years old. Excellent condition. Call 265-5116 after 5:30.

Roommate wanted for 3 bedroom townhouse in Sunnyvale starting in July. Call 732-8629 evenings or weekends. Approximately \$100 per month.

FOR SALE: Share in Ames Flying Club's Interstate Cadet. Superb condition; fresh Annual, lights, radio. Based at San Jose Muni. This is flying anyone can afford. Al Boissevain 494-0917.

Woman needed to watch 2 1/2 year old and help recuperating mother, weekdays, immediate short term and/or future long term requirement, Santa Clara area, call 243-7750 after 5:30 p.m.

Ames Promotion Plan vacancies

Notice No.	Title	Grade	Org.	Area of Consideration	Closing Date
77-85	Secretary (Typing)	GS-5/6	LB	Centerwide	6-10-77
77-86	Secretary (Steno)	GS-4/5	AFB	Centerwide & Outside	6-13-77
77-87	Procurement Clerk (Typing) or Clerk-Typist	GS-4/5 GS-3/4	ASA	Centerwide & Outside	6-13-77
77-88	Contract Specialist	GS-12/13	ASF	Centerwide	6-13-77
77-89	Contract Specialist	GS-5/7	AS	Centerwide	6-20-77

TO APPLY: Call extension 5599 or 5600.

MERIT PROMOTION PLAN SELECTIONS

Notice No.	Title	Org.	Name
77-43	Engineering Technician	FSV	Benjamin Murdwyler
77-45	Supervisory Aerospace Engineer, Assistant Chief Project Technology Branch	SPT	James Murphy
77-60	Accounting Technician	AFC	Roberta Pittman

Golf

There were lots of winners at the Point-Par Tournament held at San Jose Municipal Golf Course on May 14, 1977. The winners as reported by cochairmen Don Davis and Norm Martin are as follows:

First flight: 1 - B. Odneal, 2 - R. Ramos, 3 - J. Mullen, 4 - N. Martin, 5 - A. Petretti, 6 - P. Kutler. N. Martin was closest to the pin.

Second flight: 1 - K. Sonza, 2 - H. Mathews, 3 - R. Dick, 4 - D. Graham, 5 - C. Eddy, 6 - M. Radovich. D. Graham was closest to the pin.

Third flight: 1 - J. McCloy, 2 - G. Falkenthal, 3 - R. Richardson, 4 - B. Flippen, 5 - E. Menefee, 6 - J. Silver. G. Falkenthal was closest to the pin.

Fourth flight: 1 - C. Banducci, 2 - J. Prim, 3 - S. Tardio, 4 - B. Page, 5 - J. Gaspar, 6 - S. Johnson. C. Banducci was closest to the pin.

Dental Plan Open Season

Dental Plan Open Season will be June 1 - July 15. No significant changes. Enrollment by the 15th will be effectively the 1st.

Brochures will be available week of June 6 at Training Office; Dan Stark will be at Ames June 6 and 7 and July 11 and 12, 12:00 p.m. - 1:00 p.m. Bldg. 241 Rm. 147.

Thank you

Thanks again for a wonderful retirement luncheon and for the opportunity to meet again with many of my Ames friends. Your gift of the four bound volumes of my reports will be cherished forever, as such an assemblage would not have been possible without the generous cooperation and assistance of numerous coworkers throughout my 32 years at Ames. To hear a "flash" summary of my research career by Lloyd Jones, made me aware of how privileged I was to have associated with some of the most competent aerodynamicists in the country. The friendships that were cultivated through these associations will be remembered forever.

Sincerely,
Ed Hopkins

NASA

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The Astrogram

VOLUME XIX

NUMBER 19

June 16, 1977

Venus probe successfully tested in balloon drop

A critical segment of the entry into the atmosphere of Venus of the main probe for NASA's 1978 Pioneer-Venus mission was successfully tested late yesterday by drop of the probe from an Air Force balloon, 27 km (17 miles) above White Sands Missile Range, New Mexico.

"All test objectives appear to have been met, and the probe successfully qualified for Venus entry," commented NASA-Ames' probe system manager Simon C. Sommer.

The main probe is designed to carry instruments for the detailed measurement of Venus' atmosphere.

The test duplicated flight events just before descent into the planet's dense, hot lower atmosphere.

Demonstrated were: deployment of the probe parachute; separation of its atmosphere entry heat shield; and, after nine minutes of parachute descent, separation of the parachute for simulated flight of the probe instrument vessel down to Venus' searing surface.

Beam to speak on solar heating

Ben Beam, President of Beam Engineering, Sunnysvale, will be the guest speaker at the Ames-ACES meeting on Tuesday, June 28th at 11:30 AM in the Space Science Auditorium, Bldg. 245.

Ben is well known to many at Ames as a former Branch Chief and Assistant Division Chief in the Research Facilities and Instrumentation Division. After his retirement, Ben established Beam Engineering and has become actively involved in solar heating installations. He is particularly knowledgeable about retrofitting existing homes with these systems.

Ben's presentation on June 28th will be concerned with "Concentrating Solar Collectors for Retrofit Space Heating and Hot Water in Homes." This subject is of particular interest to those with houses now using gas or oil heating and who are considering the incorporation of solar heating into the existing system.

The Ames-ACES meetings are open to all who are interested in learning about alternative energy sources.

Objective of the Pioneer-Venus mission is to characterize Venus' relatively simple atmosphere and weather. Scientists believe this knowledge will help them understand Earth's complex weather patterns.

Two coordinated Pioneer Venus spacecraft will be launched to the cloud-shrouded planet in 1978, one in May and one in August. Both will arrive in December 1978. The orbiter spacecraft will circle Venus for a year or more. The Multiprobe spacecraft carries the main probe and three smaller probes. The four probes will enter the atmosphere on arrival, some 8,000 km (5,000 mi.) apart, and reach the surface in an hour. The main probe and one small probe will enter on the planet's day side, two other small probes on the night side. All four will measure the atmosphere from top to bottom.

The Pioneer Venus project is managed by Ames. The drop test was carried out by the U.S. Air Force Geophysics Laboratory (AFGL) using a 90,000-cubic-meter (3-million-cubic-foot) high-altitude plastic balloon.

'Ms.' comes to 171s

The U.S. Civil Service Commission has announced it is revising all its personnel forms — including job application forms — to make "Ms" available for women who prefer it. As present stocks are depleted, and forms are reprinted, the change will be incorporated in all Commission forms which require title.

The Commission has also instructed all Federal agencies under its jurisdiction to incorporate "Ms" in addition to "Miss," "Mrs.," and "Mr." on their internal personnel forms.

Federal employees have had the option to use "Ms" and/or their maiden names in payroll and personnel records since November 1975 when the Commission prescribed procedures for Federal agencies to use in officially changing the records of a woman's name and/or title upon request. This action was in response to the Comptroller General's decision A-84336 which held that a woman has the right to use her maiden name and/or the title "Ms" on Government records notwithstanding her marriage, provided that she uses the same name consistently on all such records.

Pioneer 11 again crossing orbit of Jupiter

NASA's Pioneer 11, bound for the outer reaches of the solar system, crossed the orbit of Jupiter for the second time on Friday, June 10.

The first passage occurred in December 1974, when the spacecraft flew past the giant planet itself. Jupiter's enormous gravity then "kicked" the spacecraft into a new orbit that will take it to ringed Saturn in September 1979.

The Pioneer encounter marked the first time that the massive gravity of one of the huge outer planets was used to accelerate a spacecraft and place it on a path leading to a different planet. Voyager, to be

launched this summer to Jupiter and Saturn, will also make use of this gravity-assist maneuver.

In the case of Pioneer 11, the spacecraft was aimed just ahead of and below Jupiter and the resulting kick flung Pioneer upward above the plane of the planetary orbits (the ecliptic plane) and inward, closer to the Sun. (In the attached sketch the planets are enlarged to show the path of Pioneer.)

By mid 1976, Pioneer had moved 200 million kilometers (130 million miles) closer to the Sun, was 160 million km (100 million mi.) above the outer

Dr. Frosch to become NASA administrator



President Carter has announced the nomination of physicist Dr. Robert A. Frosch, 49, to become Administrator of the National Aeronautics and Space Administration. Frosch presently is Associate Director for Applied Oceanography at the Woods Hole Oceanographic Institution on Cape Cod, Mass., a position he has held since 1975.

Frosch, if confirmed, will succeed Dr. James C. Fletcher, who resigned May 1, after six years service as NASA's Administrator.

From 1973 to 1975, Frosch was Assistant Executive Director of the United Nations Environment Program, holding the rank of Assistant Secretary General of the United Nations. Previously, from 1966 to 1973, he was Assistant Secretary of the Navy for Research and Development. In earlier years, he served in various posts involving government research and development projects.

Frosch's professional career began in 1951 with the Hudson Laboratories of Columbia University, where he worked on Naval research projects. There he progressed from Research Scientist to Director of the Laboratories, becoming Director in 1956 and remaining in that post until 1963.

Frosch, a native New Yorker, earned his A.B., A.M., and Ph.D. degrees at Columbia University. He is a member of Phi Beta Kappa and Sigma Xi. He received the Arthur S. Flemming Award in 1966 and the Navy Distinguished Public Service Award in 1969. Frosch is a member of some nine scientific professional societies and the author of numerous scientific publications. He is a member of the National Academy of Engineering.

He and his wife, Jessica, are the parents of two teenage daughters. They presently reside in Falmouth, Mass.

edge of the asteroid belt and had started the outward part of its trip to Saturn. Pioneer is now two-thirds of the way on the 2.4 billion-km (1.5 billion-mi.) trip from Jupiter to Saturn.

After passing Saturn, Pioneer will head out of the solar system, traveling roughly in the same direction as the solar system moves through the Galaxy.

Although the encounter course is not yet final, one possibility is that the spacecraft will pass between the rings of Saturn and the planet itself. Saturn's rings are 60,000 km (37,000 mi.) wide.

NASA, Soviets agree on further manned space cooperation

NASA and the U.S.S.R. Academy of Sciences have agreed on further cooperation in the area of manned space flight.

The agreement was signed May 6, 1977, by Dr. Alan M. Lovelace, Acting Administrator of NASA, and May 11, 1977, by Anatoly P. Aleksandrov, the President of the Academy of Sciences of the Soviet Union.

The agreement is designed to provide continuity of the joint technical, scientific and operational capability developed through the highly successful Apollo-Soyuz rendezvous and docking mission conducted in July 1975. Three joint working groups will prepare recommendations for two new programs, one dealing with orbital manned flight activities and the other with a possible future international space station.

The first working group will begin studies soon on scientific and applications programs that may be conducted in joint operations of the American Space Shuttle and the Soviet Salyut space station in the early 1980s. A second working group simultaneously will develop plans for these joint operations.

It is anticipated that the studies of the Shuttle/Salyut program will be completed within 18 to 24 months, producing recommendations for consideration by both sides.

The agreement also establishes a third joint working group whose task will be to conduct a series of phased studies of an international space platform, or station. If such studies develop consensus on the objectives of future space stations, further studies would be undertaken to explore possible agreement on the conceptual design of the stations.

Neither side is committed to steps beyond the initial studies and each reserves the right to proceed with its independent national space station interests. The agreement does, however, raise the possibility that the two sides may be able to concert their space station interests in some degree, thereby offering potential economies and efficiencies.

Griffin named Deputy of KSC

Gerald D. Griffin, currently Deputy Director of NASA's Hugh L. Dryden Flight Research Center, has been named Deputy Director of NASA's Kennedy Space Center. He will assume the position about July 1, replacing Miles Ross, who resigned from NASA in May.

Before becoming Deputy Director of DFRC in 1976, Griffin served for three years at NASA Headquarters, first as Assistant Administrator for Legislative Affairs and later as Deputy Associate Administrator (Operations) in the Office of Space Flight. At the Johnson Space Center, Houston, Texas, Griffin was a flight controller during the Gemini Program, a Flight Director on all eleven Apollo missions, and Lead Flight Director on Apollo 12, 15, and 17.

Griffin has received numerous awards for his NASA service, among them, two NASA Exceptional Service Medals for his work on Apollo 12 and 15, the Presidential Medal of Freedom Group Achievement Award for Apollo 13, and the NASA Headquarters Creative Management Award.

119 space processing experiment proposals received by NASA

A total of 119 proposals for materials processing experiments to be performed on flights of Space Shuttle and Spacelab have been received from researchers by Marshall Space Flight Center.

The proposals, in response to an announcement issued several weeks ago by NASA's Office of Applications, include applied and basic research projects in branches of materials science where weightlessness and ultra-high vacuum obtainable in orbital flight can be exploited to unique advantage.

The initial goal of NASA's Space Processing Program is to demonstrate the value of space for materials processing by achieving significant scientific results or developing specific useful materials and products.

Over a longer period it is expected to lead to privately-funded research and manufacturing operations in orbit.

An engineering and business evaluation of the 119 proposals has been performed by a team at Marshall Center and the Office of Applications is expected to announce the chosen projects — probably numbering between 10 and 20 — by the end of July. Projects relevant to eventual development of useful applications of space flight will be given priority.

Marshall is the lead NASA center for the Spacelab program, a cooperative venture between NASA and the European Space Agency, and has been assigned project management responsibility for the first three Spacelab payloads.

Shuttle missions will begin in 1979 and will accomplish a phased buildup of the Space Transportation System's capabilities during the first few years of operations.

Safety corner

Flammable liquids

The Consumer Product Safety Commission estimates that approximately 46,000 injuries associated with flammable liquids were treated in hospital emergency rooms in 1975. The products involved in the majority of cases were paint, varnish, shellac, paint and varnish thinners and removers, gasoline, kerosene, methyl alcohol, turpentine, automobile chemicals, cigarette lighter fluid, charcoal lighter fluid, and fuel for model cars and airplanes.

Gasoline-associated injuries stand out among those reported; 19,300 cases are estimated to have involved this highly volatile and toxic flammable liquid. Four out of every five incidents involved males, and more than half of these occurred among children less than 5 years old. According to the Ames Safety Officer, John Habermeyer, a gallon of gasoline improperly stored in your garage (breakable glass bottles), when properly vaporized will cause an explosion equivalent to 35 sticks of dynamite — sufficient to level a sizeable structure!

Travel insurance

The all purpose NASA Travel-Accident Insurance brochures are available to Ames employees from the Training Office (Bldg. 241, Room 136, ext. 5623). The brochure explains the benefits and the premium costs. An employee may enroll at any time.

Art enthusiasts

A special showing of "The Graphic Fantasies" by Roger Arno is being held during the month of June in Los Gatos. The exact location is the El Gato Gallery, 123 W. Main Street. Everyone welcome!

Aerospace Writers Association guests at Ames



Ike Gillam
Director, Space Shuttle Operations
DFRC



Dr. Robert Cooper
Director, GSFC



Herbert J. Rowe
Asst. Adm. for External Affairs
NASA Headquarters



Arnold W. Frutkin
Asst. Adm. for International Affairs
NASA Headquarters

Nearly 250 members of the Aerospace Writers Association, during their national convention in San Francisco, were guests at Ames on May 3. The group heard presentations by senior NASA officials in the Ames Auditorium and visited the flight line where NASA research aircraft and several DOD aircraft were displayed.

Helicopter structures conference slated

The rapidly advancing area of structures technology will be the subject of a special conference slated for 16-18 November 1977. The conference was recently announced by its cosponsors, The Western Region of the American Helicopter Society (AHS) and Ames. Specialists in rotorcraft structures from throughout the free world will convene at ARC to review advances in materials and structures, to discuss research goals for further development, and to identify current or future programs that could benefit from application of advanced structures technology.

The program will include three general sessions and two panel discussions. Chairmen for each of the sessions are now making final arrangements and selection of participants for each portion of the program. The conference general chairman is Andrew W. Kerr, Aerospace Engineer, U.S. Army Air Mobility Research and Development Laboratory and Vice President, AHS Western Region. The technical chairman for the meeting is Frederick H. Immen, Chief, Advanced Systems Research Office, U.S. Army Air Mobility R&D Laboratory.

In charge of arrangements is James Biggers of NASA-Ames Research Center. In announcing the meeting, Fred Immen said "Advances in structures technology have been remarkably impressive. The potential for further developments and for intensive application of present technology is extremely bright. This conference will provide the year's best opportunity to review this field and the proceedings report, which will be a NASA Technical Memorandum, will surely be an important reference for years to come."

The March-April issue of *Vertiflight* contains the call for papers which describes the conference program in more detail.

Engineering exam soon

Engineers seeking registration as Professional Engineers are advised of the July 11 deadline for returning applications to take the P.E. exam. The Engineer-In-Training examination deadline is August 16.

Review courses in the branches of Electrical, Mechanical, Industrial, Chemical, Nuclear, and Quality Engineering, as well as an E-I-T review, will begin the first week of August in Menlo Park and last for 14 weeks.

For information contact: Michael R. Lindeburg, P.E., Program Director, Professional Engineering Registration Program, P.O. Box 911, San Carlos, CA, 94070. (415)593-9731.

Job opportunities (Army)

The Civilian Personnel Office, Presidio of San Francisco, Calif., is building an applicant supply file for vacancies that occur at the U.S. Army Air Mobility Research and Development Laboratory, Moffett Field.

For those employees who have federal government reinstatement or transfer eligibility and wish to be considered for vacancies that occur for Clerk-Typist, Clerk-Steno, Voucher Examiner, Procurement Clerk (GS-3 thru GS-5), Aerospace Engineer (GS-12 and below), and Contract Specialist GS-9/11, should mail Form 171 and proof of status to the Civilian Personnel Office, Bldg. 37, attention, Ms. Betty Gaffney, Presidio of San Francisco, California 94129.

ARA ACTIVITIES

Happy hour and luau

Friday, June 24th, a Happy Hour and Luau, jointly sponsored by ARA and the Jetsetters at the Cafeteria, will feature a Hawaiian Band, a hula dancer, and roasted Kalua pig cooked all day in the ground by Master Hawaiian Chefs. Mai Tai's, made with a special Hawaiian recipe, as well as standard drinks will be sold at the bar. Hors d'oeuvres of Kalua pig and tropical fruit will be served in a Hawaiian atmosphere. Those interested in joining the Jetsetters on their upcoming trip to Hawaii can get further details on the trip and any questions answered. Sign-ups for the trip will be accepted. Wear your hula skirt or Hawaiian shirt and join us for a Hawaiian Luau. Admission \$1.50 at the door.

Theater-goers

Reduced tickets for the Houston Grand Opera production of "Porgy and Bess" at the San Francisco Opera House are available through Bill Campbell Consultants. Ticket order blanks are on the ARA Store counter in the cafeteria.

Half-price sale

Bicentennial items are on sale for 1/2 price at the ARA Store.

Caribbean jetsetter vacationers



The officers of the Ames Jet Setters wish to thank all of those who participated in the cruise to the Caribbean, and wish they all had a good time.

Bill Ross

Golf

Co-chairmen Paul Kutler and Denny Chaussee report the following winners at the Laguna Seca Golf Tournament held on June 4, 1977:

First flight: 1 - F. Lazzeroni, 2 - F. Johnson, 3 - N. Martin, 4 - J. Lee, 5 - J. Mullen, 6 - J. Martin, 7 - L. McCulley, 8 - H. Mathews.

Second flight: 1 - M. Orozco, 2 - M. Radovich, 3 - B. Odneal, 4 - A. Lopez, 5 - C. Eddy, 6 - G. Dewitt, 7 - B. Kelley, 8 - E. Menefee.

Third flight: 1 - B. Scott, 2 - T. Pulliam, 3 - J. Silver, 4 - S. Brovarney, 5 - B. Page, 6 - S. Tardio, 7 - B. McCloy, 8 - F. Wirth.

Ames mixed fives bowling league

The Ames Mixed Five Bowling League held their banquet at Villa Felice on May 13th. There were 45 bowlers in attendance for the fine dinner. Sal Tardio, Ed Tischler and Elna Rathert officiated the ceremonies. First and second place team winners are listed below:

FIRST PLACE WINNERS

Dorothy Small
Verdis Milburn
Ramon Canas
Gary Parola
George Falkenthal

SECOND PLACE WINNERS

Carolyn Sharpe
Dave Sharpe
Donna Johnson
Stu Johnson
Wayne Harry

Ames promotion plan vacancies

Notice No.	Title	Grade	Org.	Area of Consideration	Closing Date
77-70	Voucher Examiner	GS-5/6	AFG	Centerwide & Outside	6-27-77
77-91	Engineering Information Assistant	GS-5/6	RF	Centerwide & Outside	6-27-77
77-92	Secretary (Typing)	GS-4/5	SEA	Centerwide & Outside	6-24-77
77-93	Secretary (Typing)	GS-4/5	SC	Centerwide & Outside	6-24-77
77-94	Supvy AST Space Sciences (Assistant Branch Chief)	GS-13/14	SST	Centerwide	6-24-77
77-95	Secretary (Typing)	GS-4/5	RKS	Centerwide & Outside	7-1-77

TO APPLY: Call Extension 5599 or 5600

MERIT PLAN PROMOTION PLAN SELECTIONS

Notice No.	Title	Org.	Name
77-56	Budget Analyst	AR	Denise Lucy

Want ads

Transportation

1974 Triumph Spitfire, el. overdrive, low mileage, excellent condition, \$3250/offer. Call after 3 p.m., 961-7729.

1967 Mustang-289, P/S, AT, new tires and brakes, \$1300. Call after 6 p.m. 733-8678.

1972 Porsche 911T, air cond., alloys, 5 speed, AM/FM stereo, 40,000 mi., \$9,000 firm. Call 867-5728 after 6 p.m.

FOR SALE: 1974 Norton 850. \$900. Call 728-7158.

1965 Chevy Impala 327/300HP, 2-door, good tires, reliable, \$600 or offer. After 6 p.m. or weekends, 379-4289.

For sale: '66 Porsche 912, metallic bronze, new shocks and brakes, \$5300. Call Gary 287-0676 evenings.

For sale: '76 Mustang II Ghia, V-6, 4-speed console, power brakes, white with blue vinyl top, blue interior, 21,000 mi., \$4150, 295-4673, 324-1360, 967-8240.

'73 Datsun 1200, low mileage, good condition, new tires, \$2000. Call 967-5898.

1967 MG-B, runs OK. '71 engine, body in excellent shape. Good commuter. May need transmission work. \$1050 or best offer. Evenings 257-3570.

Housing

For rent: Beach house at Pajaro Dunes (near Watsonville). Completely furnished, including linens; cleaning included in the rent; beautiful views of Monterey Bay, 100 ft from the beach; tennis courts. Reserve now for summer. Call John Lundell, 252-7260.

Deluxe 2 bdrm, 2 ba apartment, \$240/mo. No children or pets. 252-3937 evenings.

3 bdrm, 2 ba, completely furnished house including linens, dishes, TV, etc. Available approx. June 1 to Sept. 1. Mayfield Mall area, Mt. View. \$375 mo. and security deposit. Phone 969-3823 before 10 a.m. or after 5 p.m.

HOUSE FOR LEASE: Sunnyvale, 3 bdrm, 2 ba, double garage, fireplace, carpets, water softener, range, refr., dishwasher. Nicely landscaped. Four miles to Ames. Available July 1, 1977. Call 736-1475 eves. and weekends.

For rent: San Jose-Willow Glen area, furnished completely, 3 bdrm/2 bth home, large dining rm, covered patio, swim club ¼-block from home (included in rental price). Lease - September 1, 1977 to July 1, 1978 (latter date flexible if desired). \$475.00/month plus utilities. Please phone 408-265-3424 after 3:30 weekdays, weekends anytime.

For rent: Deluxe 3 bdrm, 2 ba apartment. Fireplace, refrigerator, w/w carpets, garage, available immediately. No pets, children. \$375 mo. 252-3937 evenings.

For rent: Cupertino area, 3 bdrm, 2 ba, 2-car garage with shop area. AEK, double oven, dishwasher, refrigerator, hookup for washer & dryer in garage. Fireplace, lots of storage. Close to elem. school, near shopping, park, library, and DeAnza. Available about June 22. \$410/mo. 493-1936 after 5 p.m. on weekdays.

House for rent: Cupertino, 3 bdrm, 2 ba, family room, 2-car garage. Partially furnished. New washer/dryer. Quiet street, Children welcome. \$425 per month. Available Aug. 1, 1977 to June 30, 1978. Call Dennis Cunningham, 255-7408.

Miscellaneous

Russian wolfhound (Borzoi) puppies. Roger Craig, UN-7-0220.

WANTED: wooden crates. Call Suarez, 733-7059.

NRC leaving - Stereo system sale: DUAL turntable (3-speed; automatic), plexiglass dust cover, DYNACO 4-D amplifier, and DYNACO speakers (A-25) No. 2 - \$180. Call 961-0249.

House sitting done: Have local references. Call Ken Bilski, ext. 6001.

7 piece dinette, drk walnut, heavy duty vinyl seats, v. good cond. \$99. Call 964-1725.

Foam mattress, 30" wide, 4" thick, never used, \$15; sleeping bag, very little used, \$15; wall lamp, study lamp, v. good cond., \$10 ea. Call 964-1725.

All wool rug, 9x12, made in Ireland, pretty, colorful, like new, \$90. Call 964-1725.

9x12 foam pad, like new \$15. Call 964-1725.

Wanted to buy: Small utility trailer - preferably flat, no sides, or can be converted, 500 lb capacity. Phone 965-5834.

For sale: AM/FM 8-track stereo car radio, \$70. Call 969-4394, Rita Marks.

English motorcycle equipment: One extra large riding suit, Trail Master, jacket and pants by Belfast, \$35; one pair of large black Goldtop leather riding gloves, sheepskin-lined, \$18. George Lenehan, 343-9730.

For sale: Sears 19" color TV, table model. 1½ years old, excellent condition. Call 267-5116 after 5:30.

Queen size water bed complete with heater and deluxe frame. Excel. cond. \$200, 493-1617.

For sale: Camper shell for pickup truck. Height, 30"; width, 6'; length, 8'. Winnebago brand (insulated, paneled, lighted, vented). Many extras. \$250. Call after 6 p.m., 252-9406.

WANTED: Carpool to and/or from corner of Middlefield and Loma Verde in Palo Alto. Am blind, therefore cannot drive. Will share expenses. Call Jim Stevensen at ext. 5720.

Indian classical dancing taught by an outstanding exponent of such dances as Bharata Natyam. Tillana, folk dancing, etc. Teachings from first principles to advanced complex movements. Women and girls aged 4 years and upwards eligible to learn. Reasonable fees. Call 732-8641 for details.

Female roommate wanted: To share 2 bdrm, 2 ba, Mt. View apt. with working girl. \$150/month and deposit. Call 967-7292.

The Astrogram

Room 142, Admin. Mgt. Building, Phone 965-5422

The Astrogram is an official publication of the Ames Research Center, National Aeronautics and Space Administration, Moffett Field, California, and is published bi-weekly in the interest of Ames employees.

Editor Meredith Moore
Associate Editor Marcia Kadota
Reporters NASA Employees

Deadline for contributions: Thursday between publication dates

National Aeronautics and
Space Administration
Ames Research Center
Moffett Field, California 94035

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The Astrogram

VOLUME XIX NUMBER 20

June 30, 1977

Space Settlement publication

A new book titled, "Space Settlements: A Design Study" (NASA SP-413), describing in detail construction and operation of permanent settlements in space where up to "10,000 people work, raise families and live out their lives," has been published by NASA's Scientific and Technical Information Office.

The futuristic, comprehensive, 185-page volume is the result of a 10-week study conducted during the summer of 1975 to determine "engineering systems design of space settlements."

The study was sponsored by the American Society of Engineering Education and NASA. It was held at Ames and Stanford University.

The co-directors of the study group were Richard D. Johnson of Ames Center and William Verplank of Stanford University. The technical director was Gerald K. O'Neill of Princeton University, an internationally recognized authority on space settlements. Thirty-one engineers, scientists and students from throughout the country participated.

The book's eight chapters include such topics as physical properties of space, human needs in space, habitat designs, space manufacturing, agriculture and settlement locations. It is the most comprehensive engineering study of the subject undertaken to date.

The report concludes that "permanent communities can be built and inhabited off the Earth." It goes on to say that "the obstacles to further expansion of human frontiers in this way are principally philosophical, political and social rather than technical."

In his Foreword to the book, Dr. James C. Fletcher, former NASA Administrator says:

"... Settlement in space is not an authorized program, and no man can now say if or when such a dazzling venture may be formally undertaken. But by their efforts to put numbers on an idea, to assess the human and economic implications as well as technical feasibility, the participants in this effort have provided us with a vision that will engage our imagination and stretch our minds."

"Space Settlements: A Design Study," edited by Richard D. Johnson, Chief of the Biosystems Division at Ames, and Professor Charles Holbrow, Department of Physics and Astronomy, Colgate University, is for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, for \$5. The stock number is 033-000-00669-1.

Disc-shaped star discovered



Artist's conception of "disc-star" discovered in the constellation Cygnus by University of Arizona-NASA Ames Research Center team. If superimposed on the solar system, the white hot disc would engulf the Earth. The disc-star is believed to be forming planets. The disc is 20 times as wide as it is thick and the disc emits 20 times as much light as the star in its center. Disc thickness is equal to the star's diameter.

This is the first discovery of a disc-star or of a star believed in the process of forming planets.

Discovery of a "disc-star" which may be in the process of forming its own planets has been made by a team of scientists from the University of Arizona, Tucson, and Ames.

The find marks the first discovery of probable planet formation in process and is the first identification of a flat, disc-shaped, highly luminous stellar object.

The star, MWC 349, is in the constellation Cygnus and is estimated to be only 1,000 years old. Its surrounding disc of intensely glowing gas appears to have a diameter 20 times that of the central star and to emit about 10 times as much light as the star. The disc at its outer edge is calculated to be about as thick as the star's diameter. Total brightness of the new stellar object appears to be declining about one percent a month as luminous material from the glowing disc spirals into the central star. Hence, the luminous disc is expected to be gone in about 100 years.

The new star is about 10 times the size and 30 times the mass of our Sun. The Sun is 139,000 kilometers (864,000 miles) in diameter and weighs about 88 pounds per cubic foot — 141 times the density of water. The disc star is expected to live only 100 million years. This is only 1/100th as long as our Sun with a calculated life of 10 billion years.

The discovery was made by a team of astrophysicists headed by Dr. Rodger Thompson, Steward Observatory, University of Arizona. Team members were: Dr. Peter Strittmatter, director of Steward; and Drs. Edwin Erickson, Fred Witteborn, and D. W. Strecker, all of Ames.

Observations of the star were made with the 91-centimeter (36-inch) infrared telescope of Ames' Kuiper Airborne Observatory, largest in existence, and the Steward 2.3-meter (90-in.) infrared telescope. The Kuiper telescope saw the large portions of the infrared spectrum which do not penetrate the atmosphere and cannot be seen from Earth. The larger Steward telescope had better resolution. Both were needed for the discovery. Infrared observations were essential to see through the veil of dust shrouding the disc star.

The scientific team believes the significance of the find lies in the fact that planets may be forming now in the luminous disc or have just formed in the gas outside the star's luminous disc. Characteristics of this rapidly-changing disc should shed light on planet formation processes in our solar system and around other suns.

Scientists do not have a satisfactory model to explain how planets form around suns. Existing theories do agree that in formation of stars, rotating clouds of hydrogen and other elements contract due to gravity.

The rotation produces a flat, spinning disc. Material in the disc is then believed to move toward the center, eventually piling up enough mass to ignite the nuclear fusion reaction which produces starlight. However, mechanics of the process of planet formation are not understood.

With MWC 349, astronomers believe they are now watching a star and planet formation process as it happens.

(Continued on page 2)

ARA ACTIVITIES

DISCOUNT ON FOREIGN AUTO PARTS — The ARA Store now has a supply of discount cards from Economy Imports Inc. offering a 15% discount on most foreign auto parts.

SANTA CRUZ BEACH BOARDWALK — Friday, July 15, 1977, is Moffett Field, NASA-Ames day at Santa Cruz Beach Boardwalk. Coupons are available at the ARA Store. Unlimited rides from 11:00 a.m. to 11:00 p.m. for \$3.50 per person with a coupon.

Thank you

Dear Friends:

Gracia and I wish to express our great appreciation to all our friends at Ames who participated in my retirement party the evening of June 1. We have never attended a more thoroughly delightful affair. You were so generous with your gifts, too. Thank you so much for the wide angle lens for my new camera, which will be much used as we tour Europe this summer. And the specially prepared playing cards bearing pictures of Ames associates will serve as a unique and happy reminder of my years at Ames.

Dental plan

The Ames dental program enrollment period will end July 15th. Enrollment material and payments must be in the dental plan offices by that date. Meetings will be held at noon, in room 147, Building 241 on Monday, July 11th, and Tuesday, July 12th. Dan Stark, the dental health plan representative, will be here to answer questions and receive any enrollment material not already mailed. We suggest, if possible, that you turn in your enrollment material at that time to avoid missing the termination of the open season.

A new open season will be arranged next winter.

F.E.W. meetings

Tuesday, July 12, is the next meeting of the local chapter of Federally Employed Women. The South Bay Chapter will have as its guest speaker Ms. Julie O'Mara, managing partner of Response and Associates, consultants on human resource development. She is the former communications director of the Marmon Group, an international industrial conglomerate and supervisor of marketing communications for Whirlpool. The subject of her discussion will be, "The Emerging Woman in Management," and will include an exercise on Women's Issues, A Confrontation.

The July meeting will be in the Committee Room of Mercury Savings and Loan, 350 Showers Drive, Mountain View, and will start at 5:30 p.m. All federal employees are welcome.

Betty Walker honored

Mrs. Betty J. Walker was the recipient of the Lillian Brooks Coffey Award for Women for the Year of 1977 for the Churches of God in Christ, Inc. She received the award for her work in the church and achievements in the community, business and professional world. Mrs. Walker was a Pastor's wife for seven years, working with the youth in their church; she is a former District Supervisor of Women, Fresno District; a chairperson of the Youth Department, California Valley Jurisdiction, Churches of God in Christ; she is currently Assistant Chairperson of the Mission Department, California Northwest Jurisdiction of the Churches of God in Christ; President of the Music Department, Peninsula District, Redwood City, California; minister of music for the pastors' and ministers' wives chorus, area four, California Northwest Jurisdiction; assistant chairperson of the State Aides, California Northwest.

Mrs. Walker has been effective in working in convalescent homes, rehabilitation centers; member of the Board of Directors; the Mid-town/Outreach Christian Mission Center Oakland; member of the Business and Professional Womens Federation, Churches of God in Christ. Mrs. Walker is the wife of Elder Earl P. Walker, Vice Principal, Menlo-Atherton High School; mother of two daughters, Mrs. Karen Peebles and Carol Walker, Sophomore at San Francisco State University.

Kick off briefing for

1977 Space Settlement Study



John Billingham, Chief of the Ames Extraterrestrial Biology Division, and Gerald O'Neill, Director of the 1977 Space Settlement Study addressed members of this year's study.

Disc shaped star

(Continued from page 1)

Many scientists believe that as a glowing stellar disc, like that of MWC 349, cools, planets condense out, first in the outer reaches of the gas cloud and then closer to the parent sun.

The luminous disc of MWC 349 is believed to be the inner part of a surrounding larger disc of non-luminous gas in which outer planets may already have formed. Superimposed on our solar system, this non-luminous disc would extend out beyond Pluto, the outermost planet. The luminous inner disc would reach out beyond the Earth's orbit.

The intensely luminous disc is wedge-shaped in cross section. It joins the star's glowing surface and its thickness there is about 1/40th of the star's diameter.

Light coming from the glowing disc is due to the frictional heat of the atoms of gas rubbing against each other. This friction also reduces the atoms' rotational speed around the parent star, causing them to spiral in to the star. Continuous loss of this luminous gas into the central star accounts for the one percent a month loss in brightness and explains the calculated disappearance of light from the disc in about 100 years.

Dr. Thompson presented these findings at the American Astronomical Society meeting, in Atlanta, Ga. The three basic pieces of evidence for the discovery are: that the star is much brighter in visible light wavelengths than it should be, that it has steadily lost brightness since its first identification in the 1930s and that the spectrum of energy radiated is not that for a hot star. Instead its spectrum is that for a hot, glowing disc as predicted by English scientists, Drs. Lynden-Bell and Pringle.

Since the star is thought to be approximately 10,000 light years away, all observed star events actually occurred 10,000 years ago, the time required for its light to reach Earth.



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Summer seminar series

Stanford NASA-ASEE
Aerospace Technology Seminar

Summer 1977

Wednesdays - 8 p.m. - Skilling Building, Room 080 (Auditorium)

- July 6 ROBERT A. HELLIWELL, Professor of Electrical Engineering, Stanford University
"Stanford in Antarctica"
- July 13 LEONARD ORTOLANO, Professor of Civil Engineering, Stanford University
"How Environmental Factors Influence Federal Water Resources Planning"
- July 20 PAUL KRUGER, Professor of Civil Engineering, Stanford University
"Can Geothermal Energy Replace Nuclear Energy?"
- July 27 JOHN C. ARVESEN, High Altitude Missions Branch, NASA-Ames Research Center
"The U-2: The Spy Who Came in From the Cold"
- August 3 WILLIAM S. AGRAS, Professor of Psychiatry, Stanford University
"Control of High Blood Pressure by Psychological Methods: Fact or Fantasy"

This Seminar (AA298S) is available to registered Stanford students for one unit of credit (call 497-3079). The Seminar is open to all members of the community.

Ames Welfare Club

The recent voting for an increase in collections from \$1.00 to \$2.00 was passed by a 313 to 42 vote. The Council appreciates the response from the members. This means that future payments to beneficiaries will be over \$1100.00 in cash upon the death of an active member. The number of new members was very disappointing: 25 new members. If any Ames employee does not understand the Club's functions and/or would like to join, please contact one of the following council members:

President - Marnell Smith, ext. 5284
Vice president - Fred DeMuth, ext. 5638
Secretary - Etta Rosamond, ext. 5157
Treasurer - Mary Brown, ext. 5139
Member - Fred Tucker, ext. 5138
Member - Joe Auby, ext. 6065

This club is for your benefit, or rather your beneficiary, since \$1100.00 is a large sum to help during a period of such trauma.

The \$2.00 membership fee will continue until the next collection time, and then will be raised to \$3.00.

Reminder: when you change your address or want your beneficiary changed, contact the secretary to change your enrollment card.

Softball

The Ames Fastpitch Softball team for the 1977 season consists of the following players: Bruce Ganzler, Manager; Jim Myers, Mike Green, Mike Ospring, Paul Soderman, Jim Engard, John Fetter, Ray Firpo, Larry Gary, Bob Corbett, George Alger, Fred Peters, Jeff Hammill and Kevin Chargin. The team placed second in San Jose for the first half of play and in Sunnyvale there is a possible tie for first place. The second half of play is as follows:

Date	Time	Park
6/22	9:15 p.m.	Fair Oaks
6/28	8:15	Backesto
6/29	8:15	Washington
7/5	6:30	Backesto
7/6	8:15	Fair Oaks
7/13	8:15	Lakewood
7/19	6:30	Backesto
7/20	8:15	Washington
7/26	8:15	Backesto
7/27	9:15	Fair Oaks
8/2	9:00	Backesto
8/3	9:15	Washington
8/9	9:00	Backesto

Backesto Park is located in San Jose (13th and Jackson). All others in Sunnyvale - Washington (Washington and Pastoria); Fair Oaks (adjacent to Sunnyvale High School); and Lakewood (off Lawrence Expressway to Lakehaven).

Safety corner Don't feed the animals

Last week, several employees were seriously scratched and lacerated by cats at the Center. Unfortunately, many cats when no longer wanted are deposited in the surrounding areas. They live a nomadic life and become wild in these outlying areas. Many of our personnel who love animals feed them daily. This act is extremely dangerous as per the recent incidents. These animals can no longer be considered tame, loving domestic pets - they know only to survive. This loving act of feeding the cats is actually cruel - the cats propagate rapidly and during cold nights take their family inside buildings, resting inside warm motors, etc. When the machinery automatically starts the animals suffer very cruel, painful deaths and our equipment is frequently damaged and made inoperable.

Our Safety Officer, John Habermeyer, who is a real lover of animals - two St. Bernards, one collie and a recently demised cat (21 years old) - spoke with the Santa Clara County Environmental Management Agency Division of Animal Control. They warned of the impending epidemic of rabies brought about by the drought. He has some booklets about animal bites for anyone interested. Contact the Safety Office, extension 5602, N-201, Room 17. Please avoid serious personal injury and rabies. Do not entice the animals to their injury and death by feeding them on the Center.

If an animal bites anyone in your family, capture the animal if you can do it safely. If not, have someone watch it or follow it so that it can be captured by the poundman. The animal must be kept under observation for 10 days to find out if it has rabies. If the animal must be killed to protect persons from further attacks, it should not be shot through the head. The brain will have to be tested for rabies in a laboratory and it should be in good condition.

Call the pound or health department for help. They will know what to do about the biting animal. Follow their instructions. If the animal is alive, they will see that it is confined under observation for 10 days on its owner's premises or in a pound or other animal shelter. If the animal had rabies at the time of biting it will show definite signs or die within the 10 days. Then anyone bitten may have to be treated by a long series of vaccine injections to save his life. If the animal was killed, the health department will see that the head is sent to a laboratory and the brain tested for rabies.

Start washing the bite right away with detergent and running water. Keep it up for 15 minutes to wash out as much as possible of the animal's saliva.

See your doctor. The doctor will give whatever immediate treatment is needed and will decide whether or not the long series of vaccine injections will be necessary.



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Ames Promotion Plan vacancies

Notice No.	Title	Grade	Org.	Area of Consideration	Closing Date
77-96	Personnel Management Specialist (2 positions — temporary promotion)	GS-11/12	APM	Administration Directorate	7-15-77

TO APPLY: Call Extension 5599 or 5600

MERIT PROMOTION PLAN SELECTIONS

Notice No.	Title	Org.	Name
77-58	Secretary (Typist)	FLI	Sarah Brown
77-84	Contract Specialist	ASF	Richard Abbott
	Property Management Officer	AAP	Samuel Miller (Repromotion Eligible)

Want ads

Transportation

1972 VW Super Beetle. New brakes and radials. Runs well. Call John, 269-0597.

1966 Oldsmobile Delta 88 for sale. Runs. \$200. Call 732-8629 evenings.

1973 Honda 450 CB. Exc. cond., custom chrome pipes. \$800/offer. 733-0192 evenings.

1962 Buick Special. New battery, good tires, running condition. \$225. 965-9750.

1973 Honda CB750. Owned by Honda mechanic. Includes Wixom fairing and saddlebags, luggage rack, crash bar and more. Also new tires and chain. \$1250. 948-3038.

For sale: '67 Mustang convertible. 289, 3-speed, black/red, original owner, best offer. Call Dick 257-3027.

For Sale: 1974 Honda Civic, 4-speed, exc. gas mileage, 27,000 miles. Exc. cond. \$2190. Contact: Jack Cordell, 249-5500, ext. 114.

For Sale: Motorcycle, 1974 Honda 550, 4 cyl., 5,200 actual miles, fairing, rack, immaculate, \$1,300. Call 374-2369.

Motorhome for rent: sleeps 4, A/C, generator, stall shower and all amenities. Hank Asch, 996-7009.

Housing

For rent: Deluxe 3 bdrm, 2 ba apartment. Fireplace, refrigerator, w/w carpets, garage, available immediately. No pets, children. \$375 mo. 252-3937 evenings.

Two bdrm, 2½ ba townhouse rental for this summer in Sunnyvale. Completely furnished. Call Bobbi, 733-5145.

For rent: Quiet woodsy cottage studio, kitchenette and bath. Unincorporated Menlo Park. \$200/month. Available July 1. 369-4400 after 6 p.m.

For rent: 3 bdrm, 2 ba, fenced back yard, fireplace, 2-car garage, w/w carpets. \$240/month + deposit. Immediate occupancy. May become sold in future. 252-3937 evenings.

Vacation rental: In Tahoe Keys, 3-br, 2-story house. Waterfront, pvt. dock, view, fully furnished. No pets please. Call L. Ng, 736-4328.

For Lease: In beautiful Los Gatos, 3 bdrm, 2 ba, family rm, A/C, ½-acre w/pool, Los Gatos schools. Avail. 8/15/77, \$550/mo. (408)356-5285.

Miscellaneous

Bicycle \$15. Call 493-9406.

LOST: Man's Hamilton watch with black band. Lost probably outside Bldg. 243. Ext. 5272.

For Sale: Hidabed couch, black vinyl, full size, \$100. Recliner, dark green vinyl, \$50. Call 738-1019.

For Sale: 10'x12' interlocking alum. patio cover, \$150; hardwood room divider (new and unassembled), winch, 10-conductor shielded cable, 1" rope, Murphy bed (dbl rollaway) and mattress, intercom, buck saw, brush hook. 996-3049.

India silk saree, new, colorful, capturing. Can use to make a long or an evening dress. \$35. Call 964-1725.

Bedspreads, quilted, like new. Queen size, red, orange and yellow stripes, \$30; twin size, printed with blue and green flowers, \$15. 964-1725.

Overstuffed chair, heavy duty drk br Naugahyde, like new, good looking, comfortable, relaxing, can be used in living/family room, \$65. 964-1725.

Wanted: car pool partner from the vicinity of Tully and Flint, SJ. Flexible hours. Call Dewey Hodges at 5835.

For sale: Craig AM/FM 8-track stereo car deck, in-dash, 5 set buttons for radio. Less than 1 year old, used only 2½ months. Cost \$150 new, only asking \$75 or offer. (Have a cassette so don't need it anymore). Call Joan, 737-2241.

TV, 23" B&W, maple cabinet, about 2 yrs old. Looks and performs like new. \$125. Call Dick Greif, X6196.

Antenna discounts — anyone interested in buying channel master antennas at a 40% discount, call Dick Greif at X6196 before July 4.

Water softener, automatic, used 2 yrs. Exc. cond., \$175. 941-2784.

For sale: Singer Touch and Sew portable, 30-day guarantee. \$95. 257-9041.

For sale: Car top luggage carrier with lid. Water proof. \$30. Call Leroy Scheiber, 248-4999.

For sale: Baby Line crib w/matching 3-drawer chest (yellow), like new, both for \$90; brass-look fireplace screen with andirons, exc. cond., \$55; Wards power mower, runs, \$25. Call Fran, evenings or weekends, 374-9293.

For sale: Glass Odell aquarium, 29 gal, with everything including fish, and 10 gal. tank. \$70 or best offer. 961-3804.

Airquipt metal slide containers for 35-mm projector. \$1 each. Call 326-4832.

Wanted to buy: Small utility trailer — preferably flat, no sides, or can be converted, 500 lb capacity. Phone: 263-4418.

Rhodesian Ridgeback, purebred male, big, fierce looking but gentle, free to right home. 494-6084.

Retirement luncheon

You are cordially envited to attend a luncheon at Sakura Gardens, 2116 El Camino Real, Mountain View, California, on Friday, July 8, 1977, in honor of Ernest Porter, who retired in February, and Raymond Van De Moortell, who retired in May of this year. A memorandum giving further details will be distributed. If there are any questions concerning the luncheon, please call the Model Shop, extension 5413.

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