

HAO CELEBRATES ITS 40TH BIRTHDAY

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The small observing station at Climax, Colorado, founded by Walter Orr Roberts (pictured on skis at right) in 1940, was HAO's first incarnation. (All photos in this story are courtesy of HAO, with special thanks to Keith Watson and Leon Lacey for digging them out.)

HAO celebrated its 40th anniversary this week with a symposium on future prospects in solar research. Although the division prefers to look ahead, not back, to mark the anniversary, Staff Notes presents a brief history of HAO for all those interested in HAO's and NCAR's roots.

The High Altitude Observatory (HAO) predates NCAR by 20 years, tracing its origins to a small solar observing station that once stood at Climax (that's near

Leadville), Colorado. This observatory was established as a branch of the Harvard College Observatory in 1940 at the behest of the noted Harvard astronomer Donald Menzel.

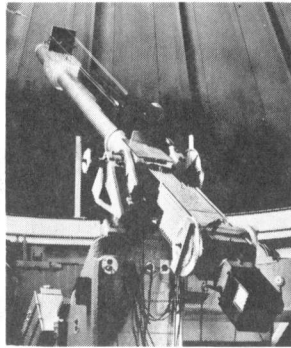
Menzel persuaded a young Harvard graduate student, Walter Orr Roberts, to leave the comforts of Massachusetts for the wilds of Colorado to gather data for his dissertation at an elevation of 11,520 feet. Walt made the long trip west carrying with him pieces of a new type of instrument called a coronagraph. This is a

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The coronagraph at Climax was the first instrument of its kind in the Western Hemisphere. Built first in Cambridge, Massachusetts (picture a), by Harvard astronomer Donald Menzel, the instrument was carted west, completed, and installed at Climax by Walt Roberts. Picture b shows the instrument as it looked in the 1940s.

special telescope containing an occulting disk that blocks the sun's bright surface and permits observations of the sun's very faint outermost layer, the corona. The instrument had been invented by the French astronomer Bernard Lyot in 1930, and Menzel, who had seen both the original and a second instrument in Switzerland, determined to build one in the United States. The Climax station resulted, and 40 years ago in early October, Walt obtained the first solar spectra from the Climax instrument, which was the world's third coronagraph, and the first in the Western Hemisphere.

Under Walt's direction, the Climax observatory immediately began making significant contributions to the field of solar physics. One major achievement in these early years, for example, was to demonstrate the correlation between solar activity (flares and other changes in the sun's corona) and conditions in the earth's magnetosphere and ionosphere. Under contract with the Office of Naval Research, the observatory sent the Navy daily reports on coronal conditions throughout the years of World War II. These reports enabled Navy radio experts to predict periods when radio communications would be difficult and to plan their strategy accordingly.

In 1946, the Climax station underwent its first major change: it became the High Altitude Observatory, a joint endeavor of the University of Colorado (CU)

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and Harvard University, with Walt as its director. The next year, Menzel, Walt, and Walt's colleague Jack Evans were asked by the U.S. Air Force to help set up another solar research facility to complement the Climax station. The result was the Upper Air Research Observatory in New Mexico, now called the Sacramento Peak Observatory (SPO). Jack Evans became SPO's first director in 1952 and the close and cordial collaboration between HAO and SPO continues to this day.

In 1955, Harvard withdrew from HAO, which became an independent, nonprofit corporation affiliated with CU. During the last half of the 1950s, HAO scientists pooled their talents with CU's faculty to form the University's Department of Astro-Geophysics. The launching of the Sputnik satellite by the Russians in 1957 added impetus to the growing interest in basic science research and HAO and the CU science faculty grew as a result.

Partially in response to the need for basic research spurred by Sputnik, the National Science Foundation established NCAR in 1960. HAO's second major change occurred the following year, when the observatory merged with NCAR and Walt became the first president of UCAR and the first director of NCAR. The work at HAO was now under the direction of a young solar physicist named John Firor.

The 1960s were busy years at HAO and NCAR. During the first few years of that decade, HAO's staff nearly doubled. They traveled the world to study eclipses and launched balloons to study the sun from as high in the atmosphere as possible. That decade also saw HAO establish a second observing station in Hawaii, now on Mauna Loa. Most importantly, during this time extensive theoretical work brought forth exciting results in areas of



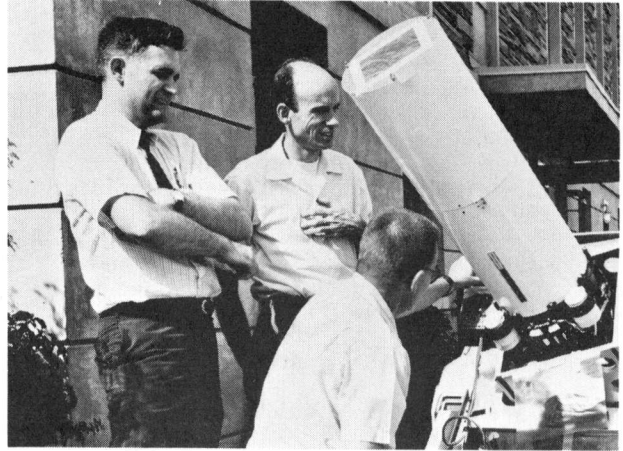
Jack Evans, one of HAO's first staff members, helped to select the site for the Sacramento Peak Observatory and became its first director in 1952.



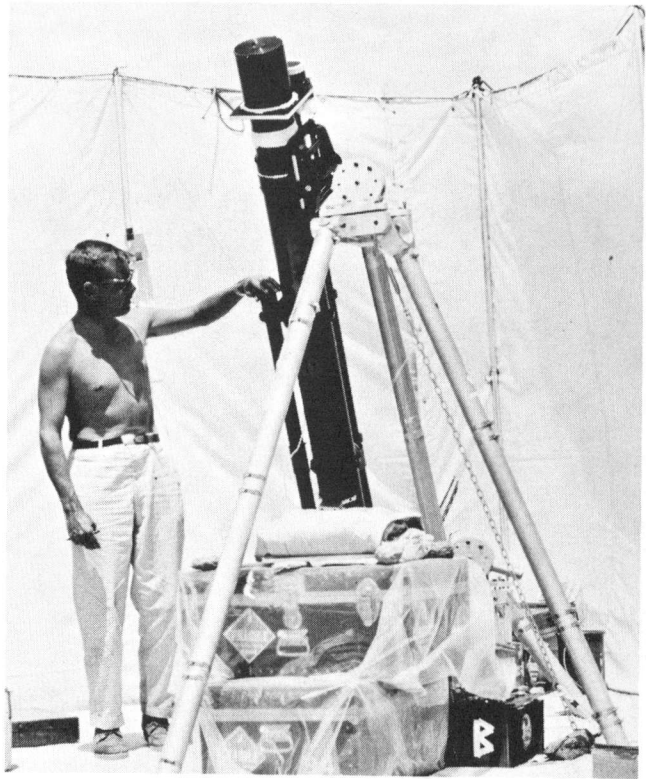
The HAO staff in 1954. Front row (left to right): Rudy Cook, Bob Cooper, Kay Virnelson, Sebena Schaffner, and Walt Roberts. Second row: Gerard Wlerick, Bob Low, Bud Pearson. Third row: Lee Lacey, Don Billings, Bill Wright. Fourth row: Dorothy Trotter, Bob Lee, Kay Vollmer. Top row: Mary Ranspot, unknown, and Jennifer Harris.

radiative transfer and chromospheric and coronal structures. In 1968, Walt, feeling the burdens of managing a growing NCAR, passed on his duties as NCAR director to John Firor and concentrated on his tasks as UCAR president. Gordon Newkirk, who had pioneered much of HAO's coronal research, took over as HAO's third director.

During the 1970s, HAO continued to make major contributions to solar research. If Sputnik spurred the growth of research during the 1960s, perhaps then the 1970s were shaped by another satellite, Skylab. Launched in 1973, and carrying an HAO-designed coronagraph among its many instruments, this manned orbiting solar observatory dramatically changed our view of the sun. The Skylab instruments showed us a much more active sun than scientists had imagined, even during a so-called quiet period.



(Left to right) Jack Eddy, John Firor, and, with his back to the camera, Bob Lee preparing HAO's coronagraph for the 1966 eclipse expedition to Bolivia.



HAO's coronal camera experiment at a site near Pulacayo, Bolivia, is being prepared for the 1966 eclipse by Gordon Newkirk.

The HAO endeavor includes more than experimental programs such as the Skylab mission, however. During this past decade, HAO's staff has worked on developing theoretical models of the sun's interior and of coronal expansion, documenting long-term solar cycle variations, and continuing its studies of coronal structures and dynamics. And the influence of the sun on the earth's environment is a research topic pioneered at HAO.

The 1970s saw changes as well. In 1972, the Climax station was closed and finally dismantled in 1975. And Walt, in many ways the founding father of both HAO and NCAR, resigned his post as UCAR president in 1973 to join the Aspen Institute in Boulder.

This past year bodes well for HAO's continued vitality. During one week in February, HAO fielded the most extensive observing program ever undertaken by the Observatory. On 4 February, the new Mark III K-coronameter, an instrument that was designed and built entirely by HAO staff and installed last year in the Mauna Loa station, became operational. On Valentine's Day, 14 February, NASA launched the Solar Maximum Mission satellite, carrying on board an HAO coronagraph/polarimeter. Last year, the HAO/SPO Stokes polarimeter was revamped and its speed greatly enhanced, and another instrument, the coronal emission line polarimeter, also at SPO, remained active. Finally, on 16 February, the third

in HAO's series of rocket-borne coronagraphs was launched from White Sands, New Mexico. These various observing platforms had been planned to coincide as closely as possible with the eclipse in India on 16 February, where the HAO coronal eclipse camera carried out observations during the brief period of totality.

This year has been eventful in other respects. In May, the division moved into NCAR's Mesa Laboratory, leaving behind the buildings on CU's campus that had housed its staff since 1960. And August saw the ground-breaking for the addition to the Mesa Lab that will house HAO's new solar observatory, vacuum tunnel, and laboratories. Overseeing all this activity is HAO's fourth director, Robert MacQueen (Gordon resigned last year, citing a desire to return to his research).

"An anniversary provides a time to assess the state of our discipline and our own organization," Bob told *Staff Notes*. "Solar physics remains one of the more exciting and complex areas of modern-day astrophysics; the problems are different and challenging, but solvable. I think we can say that HAO remains one of the leading solar research organizations in the world, a direct result of the extraordinary quality of its staff. We all look forward to an exciting future."

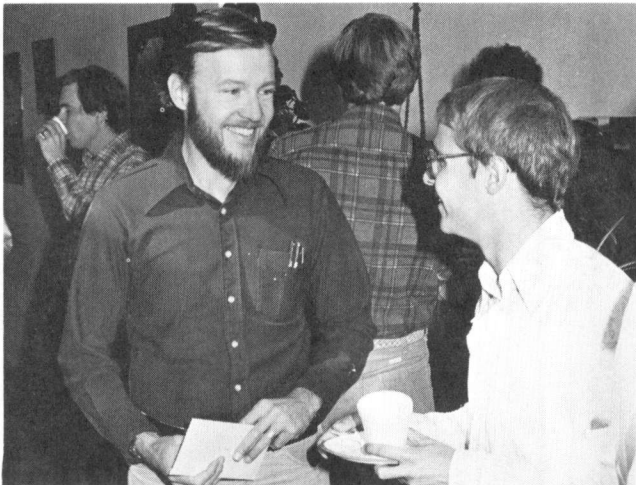
Clearly, HAO at 40 years of age, is alive, well, and as vibrant as ever. • SB

MAURICE MOVES TO AAP

Advanced Study Program (ASP) visitors and staff flocked to the fifth floor last week to bid a fond "hail but not farewell" to Maurice Blackmon. Maurice has moved from chairman of ASP to scientist with the Climate Project in the Atmospheric Analysis and Prediction Division.

Amid piles of homemade cakes and pies brought in by ASP staff members, Maurice brought *Staff Notes* up to date: "I'll be working on NCAR's spectral model and continuing with the observational work I was doing in ASP." Maurice first came to NCAR as a senior postdoctoral fellow with ASP in 1974; he was on leave at the time from Syracuse University where he had been a professor of physics since 1969. "In coming to NCAR as a postdoc, I managed to change fields--from work on the theory of elementary particles to research on large-scale atmospheric dynamics and climatology. It was a big jump. In assuming the chairmanship of ASP in early 1976, I returned in many ways to my old role as professor, and it was a rewarding period of my life. However, I think it is time for a change, and I am looking forward to returning to research full time." • SB

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Former ASP chairman Maurice Blackmon chats with postdoctoral fellow Jim Kasting at a party for him last Thursday, 2 October, thrown by the ASP staff.

ANNUAL MEETING OF THE UCAR MEMBERS' REPRESENTATIVES

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The annual meeting of the member institutions of UCAR will begin next Tuesday, 14 October, at 1:00 p.m. and will conclude on Wednesday morning just before noon. The meeting will take place in the Main Seminar Room, except for the workshop sessions in the late afternoon on Tuesday. As in the past, NCAR staff members are welcome as observers on a space-available basis. (Space is limited because of the large number of Members' Representatives and Trustees who attend these meetings.)

The workshop this year will deal with the needs of facilities in the atmospheric sciences. The combination of severe inflation and restricted budgets requires careful examination of funding priorities in order to maintain the balance between research programs and facility capabilities. At the same time, the need for major capital investment to sustain adequate facility support is unquestioned. The workshop sessions will give an opportunity to discuss the establishment of facility requirements,

the centralization and distribution of facilities, the evaluation of facility capabilities and performance, and the innovative methods of financing facilities.

Workshop sessions will begin at 3:00 p.m. Tuesday with the Members' Representatives, Trustees, and NCAR division directors dividing into three groups. (The three locations are the Damon Room South, the Damon Room North, and the Board Room in the Fleischmann Building.) Each group will discuss all aspects of the topic described above. NCAR staff members may observe these sessions, again on a space-available basis. The workshops will adjourn at approximately 5:30 p.m.

Donald Veal, chairman of the UCAR Agenda Committee which planned the workshop, will summarize all discussions at Wednesday's plenary session, beginning about 11:00 a.m. •

ANNOUNCEMENTS

SKI CLUB MEETING

Next Thursday, 16 October, the NCAR Ski Club will hold its general information meeting at 12:00 noon in the Main Seminar Room. Staff members may bring their lunches and enjoy an inspirational skiing film. The meeting will provide information on the ski club, trips planned for this season, the American Ski Association, and other ski-related activities. New ski club officers and board members will also be introduced.

Although the planned trips focus on downhill skiing, the ski club welcomes and encourages any suggestions from cross-country skiers for organizing ski tours. In the past, cross-country skiers have toured various trails and used the transportation and lodging offered by the ski club.

DENVER AVALANCHE SOCCER NIGHT

The Employee Activities Committee (EAC) will sponsor an NCAR night at the Denver Avalanche Major Indoor Soccer League game on Saturday night, 22 November, at McNichols Arena. A minimum number of 50 people is necessary for the event, and ticket prices are \$5. Two complimentary scholarships to the Avalanche's youth soccer camp and two passes to a postgame party will be given to the group. A drawing will be held for these. Also, 5% of the total cost of the tickets will be refunded to the EAC. For information or reservations, call Bill Kohri, ext. 250.

WORD PROCESSING

The Word Processing Committee would like to announce that the first shipment of MICOM equipment has arrived on NCAR's loading dock. Training on this equipment begins next week.

GOOD NEWS!

Colorado House bill 1264, recently enacted by the Colorado general assembly, reduces income tax liability for Colorado taxpayers. There will be a reduction in the Colorado state tax for NCAR employees starting with the 17 October payroll checks.

PHOTOGRAPHICS WILL BE CLOSED

Next Wednesday, 15 October, the Photographics Department in the Mesa Laboratory will be closed for the day while the staff attends a seminar at the Eastman Kodak Company.

NEXT YEAR'S HOLIDAYS

As mentioned in the 26 September issue of *Staff Notes*, the Employee Activities Committee has been collecting staff votes for the two floating holidays for 1981. The winners, approved by the director, are Friday, 22 May (making Memorial Day a four-day weekend), and Thursday, 24 December.

ASP TO SPONSOR VISITORS' EDUCATIONAL SEMINAR SERIES

The Advanced Study Program (ASP) is sponsoring a series of eight seminars for NCAR visitors and staff. The series will begin Friday, 17 October, at 3:30 p.m. in the Damon Room with an introductory talk about NCAR research presented by director Wilmot Hess. A reception will follow. NCAR scientists, other interested staff members, and visitors are encouraged to attend. Subsequent seminars will be held on Wednesdays in the NCAR Main Seminar Room at 3:30 p.m.

The seminars are designed primarily to acquaint visitors with the broad range of challenging research problems under investigation at NCAR and the facilities that are available. The first Wednesday seminar will describe the NCAR Library as a research facility. The remaining seminars will be given by NCAR division directors and will constitute an overview of NCAR research in progress. A tentative schedule is given below. The seminars will be listed weekly in *Calendar Notes*.

Date	Topic	Speaker
Oct.		
17	Introductory talk (followed by reception)	Wilmot Hess
22	NCAR Library	Charles Wenger
29	Atmospheric Chemistry and Aeronomy Division Research	Ralph Cicerone
Nov.		
5	Atmospheric Analysis and Prediction Division Research	Cecil Leith
12	High Altitude Observatory Research	Robert MacQueen
19	Convective Storms Division Research	Patrick Squires
26	No seminar scheduled	
Dec.		
3	Scientific Computing Division Research	Walter Macintyre
10	Atmospheric Technology Division Research	Robert Serafin



CAFETERIA NEWS

The "special special" for next Wednesday, 15 October, will be french fried shrimp with cocktail sauce, hush puppies, cole slaw, jello, and coffee or tea, for \$2.

The breakfast special for next week will be huevos rancheros for \$1.10.

This week's winner of a free luncheon is:

W.H. BLUMENTHAL

HOW'S YOUR HEART?

The Employee Activities Committee is again sponsoring the HEARTSCREEN program for interested NCAR staff members and their families. This program consists of a 40-minute test that evaluates 10 cardiovascular risk factors. It is designed as a preventive medicine program to reduce the risk of cardiovascular disease. Prior to the screening, each participant will receive a questionnaire and a data form dealing with these risk factors. Results will be mailed to each participant within 10 days of the screening and all results are strictly confidential.

A memo detailing the HEARTSCREEN program will be distributed to the staff in the near future. The screening will occur on 6 November from 8:30 a.m. to 4:30 p.m. in the Damon Room of the Mesa Laboratory. As the memo will explain, the cost of the program is \$36 per participant and registration for the program should be made in advance. To register for HEARTSCREEN, or if you have any questions, please call HEARTSCREEN representative Bege Kiker at 773-2626.

VISITORS

Timothy Bay, *Omniv.* Field of interest: Weather modification. 15-17 October.
--Diane Johnson, Information Office

Timothy Gilpin, Scripps Institution of Oceanography. Field of interest: Marine chemistry. 30 September 1980 - 30 September 1981. ML room 174, ext. 643.
--Ralph Cicerone, Atmospheric Chemistry and Aeronomy Division

Stephen Nelson, National Severe Storms Laboratory, Norman, Oklahoma. Field of interest: Hail growth. 13-17 October. RL-6 room E131, ext. 77-163.
--Nancy Knight, Convective Storms Division

Richard Pearson, University of Michigan. Field of interest: Gas and aerosol measurements. 8-23 October. ML room 162, ext. 253.

--Anthony Delany, Atmospheric Chemistry and Aeronomy Division

James Shutter, Scripps Institution of Oceanography. Field of interest: Marine chemistry. 1 October 1980 - 1 October 1981. ML room 174, ext. 643.

--Ralph Cicerone, Atmospheric Chemistry and Aeronomy Division

Michel Verstraete, World Meteorological Organization, Geneva, Switzerland. Field of interest: Climatology. 6-8 October.

--William Kellogg, Advanced Study Program

Derek Winstanley, Oxford University, England. Field of interest: Climatic variability. 6 October 1980 - 5 October 1981. ML room 320C, ext. 477.

--Stephen Schneider, Advanced Study Program

The following visitors will attend the Advisory Panel meeting for NCAR's Research Aviation Facility, which will be held 15-16 October.

Joanne Simpson (Chairperson)
Goddard Space Flight Center

Roscoe Braham Jr.
University of Chicago

John Winchester
Florida State University

William Cooper
University of Wyoming

Joost Businger
University of Washington

Warren Johnson
SRI International

Currie Downie
National Science Foundation

LIBRARY NEWS

10 October 1980

SAMPLE JOURNALS FOR REVIEW

The following journals are available in the library for your review and evaluation. We would appreciate your comments as to whether the library should subscribe to them:

- ENVIRONMENTAL POLLUTION SERIES B: CHEMICAL AND PHYSICAL. Sept. 1980. Quarterly.
INTERNATIONAL JOURNAL OF THERMOPHYSICS. March 1980. Quarterly.
THE MATHEMATICAL INTELLIGENCER. Sept. 1980. Quarterly.
TECHNOLOGY REVIEW. July 1979. 8 times a year.

NEW BOOKS

REFERENCE BOOKS DO NOT CIRCULATE.

- QA76.13 In8 1980 REF. INTERNATIONAL DIRECTORY OF SOFTWARE. CUYB Publications Ltd. Bournemouth, England.
QC851 M555 1978. THE MIDDLE ATMOSPHERE AS OBSERVED FROM BALLOONS, ROCKETS, AND SATELLITES: A ROYAL SOCIETY DISCUSSION, ARRANGED BY THE BRITISH NATIONAL COMMITTEE(S) ON SPACE RESEARCH AND SOLAR-TERRESTRIAL PHYSICS. Massey H. S. W.
QC861.2 B36 1976. ATMOSPHERE, WEATHER, AND CLIMATE 3rd Ed. Barry R. G.
QC861.2 I74 1980. ATMOSPHERIC PHYSICS. Iribarne J. V.
QC861.2 N38 1979. ATMOSPHERE, WEATHER, AND CLIMATE: AN INTRODUCTION TO METEOROLOGY. Navarra J. G.
QC975.2 M66 1980. MONTE CARLO METHODS IN ATMOSPHERIC OPTICS SPRINGER SERIES IN OPTICAL SCIENCES; V. 12. Marchuk G. I.
QD31.2 B68 1979. ENVIRONMENTAL CHEMISTRY OF THE ELEMENTS REVISION OF TRACE ELEMENTS IN BIOCHEMISTRY. Bowen H. J. M.
QH545 A17N37 1978. NATO CONFERENCE ON EFFECTS OF ACID PRECIPITATION ON VEGETATION AND SOILS, TORONTO, 1978. Hutchinson T. C., ed.
QH545 A17R62 1979. ROCHESTER INTERNATIONAL CONFERENCE ON ENVIRONMENTAL TOXICITY 12th, 1979 POLLUTED RAIN. Toribara T. Y., ed.
T11 B37 1978. SCIENTISTS MUST WRITE: A GUIDE TO BETTER WRITING FOR SCIENTISTS, ENGINEERS AND STUDENTS. Barrass R.

NEW TECHNICAL REPORTS

ATMOSPHERIC SCIENCE

- 1-9455. THE DESIGN OF METEOROLOGICAL FIELD EXPERIMENTS WITH APPLICATIONS TO THE MESOSCALE. Johnson K. W. 1979 Mar.
1-9456. PHOTOCHEMICAL OXYDANTS AND THEIR PRECURSORS IN THE ATMOSPHERE EFFECTS, FORMATION, TRANSPORT AND ABATEMENT. Organisation for Economic Co-operation and Development Paris. 1979.
1-9458. IMPACT ASSESSMENTS OF MAJOR CLIMATIC AND OTHER NATURAL EVENTS. U.S. National Oceanic and Atmospheric Administration. 1980.
1-9459. ACCURACY OF POINT PRECIPITATION MEASUREMENTS. Allerup P., et. al. 1979.
1-9460. INVESTIGATIONS OF SNOW COVER IN THE STEVNS IHD-REPRESENTATIVE BASIN, WINTER 1977-78. Allerup P., et. al. 1980.
1-9461. A MODEL OF STOCHASTIC STRUCTURE OF DAILY PRECIPITATION OVER AN AREA. Richardson C. W. 1977.
1-9462. STOCHASTIC MODELING OF HYDROLOGIC, INTERMITTENT DAILY PROCESSES. Kelman J. 1977.
1-9464. THEORETICAL STUDIES OF FINITE-DIFFERENCE GRIDS USED IN GENERAL CIRCULATION MODELS PART I. Su C.C., et. al. 1980.
1-9465. PRELIMINARY ANALYSIS OF EXPERIMENTS ON THE CLIMATIC EFFECTS OF INCREASED CO² WITH THE OREGON STATE UNIVERSITY ATMOSPHERIC GENERAL CIRCULATION MODEL. Gates W. L., et. al. 1980.
1-9466. STATISTICAL EVALUATION OF CLIMATE EXPERIMENTS WITH GENERAL CIRCULATION MODELS: INFERENCES ABOUT MEANS. Katz R. W. 1980.

NEW MICROFICHE

ATMOSPHERIC SCIENCE

- ADA081151. UPPER ATMOSPHERE ROTATION RATE DETERMINED FROM THE ORBIT OF CHINA 6 ROCKET 1976-87B. Hiller H. 1979.
- ADA081089. DEFORMATION OF THE MARINE INVERSION AND THE DEVELOPMENT OF MARINE FOG AND STRATUS RESULTING FROM WARM WATER PATCHES NUMERICAL MODELING AND VERIFICATION WITH SATELLITE IMAGERY. Rogers C. W., et. al. 1979.
- ADA080592. RAPID SCANNING MEASUREMENTS OF WIND PRODUCED DOPPLER ON AN ASYMMETRICAL MICROWAVE TRANSHORIZON PROPAGATION PATH. Fleming R. D. 1979.
- ADA080426. NOWCASTS AND SHORT RANGE 0-2 HOUR FORECASTS OF THUNDERSTORMS AND SEVERE CONVECTIVE WEATHER FOR USE IN AIR TRAFFIC CONTROL. Alaka M. A., et.al. 1979.
- ADA080217. MARKOV SIMULATIONS OF ONE AND TWO DIMENSIONAL WEATHER DATA BASES. Schroeder S. R. 1979.
- ADA080212. STOCHASTIC REPRESENTATION FOR THE PRINCIPAL EIGENVALUE OF A SECOND ORDER DIFFERENTIAL EQUATION. Karatzas I. 1979.

COMPUTER SCIENCE

- ADA081090. DIGITAL SCREENING AND HALFTONE TECHNIQUES FOR RASTER PROCESSING. Rosenthal R. L. 1980.
- ADA080626. MULTICS REMOTE DATA ENTRY SYSTEM VOLUME II CLUSTERING ADDITIONS TO MOOS. Dyar J. D. 1979.
- ADA080582. MINIMAX AND ADMISSIBLE SUBSET SELECTION RULE FOR THE LEAST PROBABLE MULTINOMIAL CELL. Berger R. L. 1979.
- N8018652. AUTOMATED SYSTEM FOR NUMERICAL FORECASTS OF TIDAL HEIGHTS WIND DRIVEN SEAS. Sanders J. 1979.
- N8017750. INTERACTIVE SYSTEM FOR APPLICATION ORIENTED INPUT IN A PROFESSIONAL TERMINOLOGY OF CATCHWORDS. Knorz G. 1978.
- N8017746. PACKAGE OF ROUTINES FOR LINEAR INVERSE PROBLEMS VOLUME 4 FITTING PROCEDURES IN NORM LINFINITY. Cuer M., et.al. 1979.
- N8017744. PACKAGE OF ROUTINES FOR LINEAR INVERSE PROBLEMS VOLUME 2 ELEMENTARY LINEAR PROGRAMMING ALGORITHMS. Cuer M., et.al. 1979.
- ADA080521. OPTIMAL MULTIPROCESSOR SCHEDULING OF PERIODIC TASKS IN A REAL TIME ENVIRONMENT. Seward W. D. 1979.
- ADA080446. NEW METHODS FOR ESTIMATING TAIL PROBABILITIES AND EXTREME VALUE DISTRIBUTIONS. Breiman L., et.al. 1979.
- ADA081070. NESTED PARTITIONING PROCEDURE FOR NUMERICAL MULTIPLE INTEGRATION. Friedman J. H., et.al. 1979.
- ADA081043. PLANNING OF AUTOMATED DATA ACQUISITION AND PROCESS CONTROL SYSTEMS (ADACS). Multer R. H. 1980.
- ADA081037. PORTABLE THREE DIMENSIONAL COMPUTER GRAPHICS SOFTWARE PACKAGE. Rood H. J. 1978.
- ADA081036. BASIC HARDWARE INTERCONNECTION MECHANISMS FOR BUILDING MULTIPLE MICROCOMPUTER SYSTEMS. Carey B. J., et.al. 1979.
- ADA080998. NUMERICAL METHOD TO INTEGRATE STIFF SYSTEMS OF ORDINARY DIFFERENTIAL EQUATIONS. Coffee T. P., et.al. 1980.
- ADA080912. PERFORMANCE OF LEAST SQUARES ESTIMATORS IN TYPE II CENSORED ACCELERATED LIFE TESTS. Bhattacharyya G. K., et.al. 1979.
- ADA080902. DISTRIBUTED ALGORITHM FOR MINIMUM WEIGHT SPANNING TREES REVISION. Gallager R. G., et.al. 1979.
- ADA080898. SCREENING CRITERION FOR DELIVERED SOURCE IN MILITARY SOFTWARE VOLUME II. APPENDICES A THROUGH H. Pariseau R. J. 1979.
- ADA080897. SCREENING CRITERION FOR DELIVERED SOURCE IN MILITARY SOFTWARE VOLUME I. Pariseau R. J. 1979.
- ADA080750. ACCEPTANCE TESTS FOR THE RAE SCIENTIFIC DATABASE THE SCHEMA AND SUBSCHEMA COMPILER TESTS. Cummings I. M. 1979.
- ADA080432. SOFTWARE RELIABILITY ESTIMATION UNDER CONDITIONS OF INCOMPLETE INFORMATION CONDITIONS OF INCOMPLETE INFORMATION. Rushforth C. K., et.al. 1979.
- ADA080432. FEASIBILITY TEST OF THE GRAPHIX I OPTICAL CHARACTER RECOGNITION SYSTEM FOR THE CAPTURE OF PRINTED CYRILLIC TEST. Griffith A. K., et.al. 1979.
- ADA080420. MIME MICROPROGRAMMABLE MINICOMPUTER EMULATOR PHASE II VOLUME II. Hoyt T. R., et.al. 1979.
- ADA080418. SYSTEM DESIGN TOOL FOR AUTOMATICALLY GENERATING FLOWCHARTS AND PREPROCESSING PASCAL. Keller J. H. 1979.
- ADA080410. GRAPH MODEL REPRESENTATION OF A DISTRIBUTED PROCESSOR COMPUTER SYSTEM MASTERS THESIS. Palmer L. A. 1979.
- ADA080407. CROSS VALIDATION OF SELECTION OF VARIABLES IN MULTIPLE REGRESSION MASTERS THESIS. Cafarella J. R. 1979.
- ADA080395. DESIGN AND IMPLEMENTATION OF A PEDAGOGICAL RELATIONAL DATABASE SYSTEM. Roth M. A. 1979.
- ADA080387. MINIMAX STOPPING RULES WHEN THE UNDERLYING DISTRIBUTION IS UNIFORM. Samuels S. M. 1979.
- ADA080360. MIME MICROPROGRAMMABLE MINICOMPUTER EMULATOR PHASE II VOLUME I. Hoyt T. R., et.al. 1979.
- ADA080311. COLLOCATION WITH POLYNOMIAL AND TAUT SPLINES FOR SINGULARLY PERTURBED BOUNDARY VALUE PROBLEMS. Flaherty J. E., et.al. 1979.
- ADA080276. RECURSIVE ESTIMATION USING MIXED LINEAR MODELS WITH AUTOREGRESSIVE RANDOM EFFECTS. Harville D. A. 1979.
- ADA080214. VALIDATION AND RECEIVER DESIGN FOR A RANDOM POINT PROCESS MODEL OF ATMOSPHERIC RADIO NOISE. Stach J. F. 1979.

JOB OPENINGS

October 8, 1980

NCAR is an equal opportunity/affirmative action employer.

Salaries for new employees and for current employees receiving reassignments will be between the range minimum and maximum shown for each job. Specific starting salaries are determined by comparing the applicant's qualifications with the job requirements and assessing expected performance levels.

REGULAR, FULL-TIME

Division Director - #2567

ATD

Exempt range 92: \$38,757 - 60,079/year

DUTIES: Technical and administrative leader responsible for overall performance and long term success of the division and NCAR's representative to the scientific community with respect to field facility planning and operation, particularly in planning and conduct of major national and international field research programs; for development of modern capabilities to meet needs of research community; and for ensuring fair and effective allocation of ATD resources. Will participate in overall planning and management of NCAR and assist NCAR and UCAR management in devising methods for funding development, acquisition and operation of field facilities. Will ensure effective administration of division and effective pursuit of NCAR's affirmative action goals.

REQUIRES:

- Ph. D. or equivalent in physical science or engineering
- Broad knowledge of atmospheric research facilities, and breadth of vision about field facilities needed in atmospheric research to pursue major goals of the science, and research experience in the use of such facilities
- Demonstrated skill in working cooperatively with scientists and organizations
- Demonstrated skills in planning, staffing and managing major field facilities

ALSO DESIRED, BUT NOT REQUIRED:

- Skill in devising and implementing a variety of funding and procurement strategies
- Demonstrated administrative skills in such matters as recruiting and management of technical and scientific staff, affirmative action, negotiation and monitoring of contracts and agreements; and budgeting of fiscal management
- Effective communication, advocacy and diplomatic skills

Margareta Domecki, X581

Electronics Engineer III - #2522

ATD - National Scientific Balloon Facility

Exempt range 58: \$24,384 - 37,800/year

DUTIES: Will conduct research and development efforts in electronics for the NSBF. Will perform hands-on design efforts for electronics devices and systems used in high altitude scientific ballooning. Will represent the NSBF in conferences and meetings to present information, resolve questions and plan and coordinate work. May supervise work of a small number of engineers and technicians.

REQUIRES:

- BSEE
- High level skill in design of solid state devices, RF systems and system integration
- Knowledge of telecommand and data retrieval through use of satellites
- Skill in planning, scheduling and coordinating detailed phases of engineering work
- Skill at making independent decisions on engineering problems and methods
- Some skill in FORTRAN programming
- Skill in writing technical papers and reports
- Ability/willingness to travel about twice a year on trips lasting from seven to ten days each
- Skill in effectively interacting with subordinate staff, upper management and scientific staff within NCAR and from academic and governmental institutions

ALSO DESIRED, BUT NOT REQUIRED:

- Skill in BASIC programming

This position is located in Palestine, Texas.
Margareta Domecki, X581

Electronic Technician III - #2583

CSD

Non-exempt range 30: \$1,399 - 1,812/month

DUTIES: Will be primarily responsible for installation, maintenance, repair and calibration of a variety of FM and AM radio equipment and for assistance in the design of a mobile radio shack and equipment storage facility. Will aid and support other technicians in areas such as aircraft tracking system and sail plane activities.

REQUIRES:

- 1st or 2nd class FCC Commercial Radio Telephone Operators License
- High level of understanding of electronic circuits (analog and digital) such as are common to modern communications equipment
- Skill at diagnosing and repairing faults in sophisticated electronic circuits
- Skill at using and caring for sophisticated electronic test equipment
- Familiarity with tower erection, maintenance and safety procedures (especially for crank-up and expandable towers)
- Willingness and ability to service tower-mounted equipment
- Skill working with minimum supervision to maintain radio equipment and their associated service records
- Familiarity with a wide variety of available radio products (from antenna hardware to state-of-the-art transceivers)
- Willingness/ability to participate in field trips away from Boulder (about three months per year)

Margareta Domecki, X581

Electronics Technician II - III - #2613

CSD

Non-exempt range 28: \$1156 - 1498/month
30: \$1399 - 1812/month

DUTIES: Will be responsible for construction, testing, troubleshooting, maintenance and operation of electronic equipment to be used in the summer field experiment in Montana in 1981. Also responsible for the accurate and timely completion of the assembly of a large number of electronic circuit boards. At level III, may also coordinate work of other technicians.

REQUIRES (for II level):

- Knowledge of digital electronics and familiarity with commonly used digital integrated circuits. Familiarity with analog interfaces to digital circuitry
- Skill at using and caring for sophisticated electronic circuits
- Skill at diagnosing and repairing faults in sophisticated electronic circuits
- Skill at doing assembly work neatly and accurately
- Willingness to and skill at performing tedious wirewrap assembly work for extended periods of time
- Willingness/ability to participate in field trips and spend majority of summer away from Boulder

- Skill at organizing area of responsibility in an efficient manner
- Ability to obtain GSA driver's license (to qualify one cannot have more than two moving violations in last 3 years)
- Physical strength to lift about 50 lbs regularly and physical stamina to work outside during phase of installation of equipment

ALSO DESIRED, BUT NOT REQUIRED (for II and III level):

- Understanding of minicomputer operating system with knowledge of some programming language
- Understanding of microprocessor technology
- Understanding of radio communications practices

REQUIRES (for III level):

- Demonstrated high level of competence in all the knowledge and skills listed above
- Demonstrated skill at working with minimum amount of supervision on various complex technical problems, preferably in research and development environment

Margareta Domecki, X581

Engineer IV - #2504

ATD - FOF

Exempt range 59: \$29,508 - 45,744/year

DUTIES: Is responsible for overall management of the Remote Sensing Group including all functions associated with development, operation and maintenance of meteorological Doppler radars, lidar and other remote sensing facilities which support several major research programs each year.

REQUIRES:

- Advanced degree or equivalent in EE, physics or applied mathematics
- Knowledge of pulsed Doppler radar theory
- Knowledge of digital radar signal processing techniques
- Knowledge of analog processing techniques
- Knowledge of transmitters, receivers, antennas, state-of-the-art hardware
- Skill in overall radar system analysis and design
- Hands-on skill in designing and developing one or more of the above component areas for radar systems
- Skill level normally associated with persons having 10 or more years experience
- Skill in technical leadership, management and planning
- Skill in effectively interacting with subordinate staff, upper management, and scientific staff within NCAR and from academic and governmental institutions
- Willingness to manage group in ways consistent with NCAR policies and Affirmative Action program

ALSO DESIRED, BUT NOT REQUIRED:

- Knowledge of field of Doppler radar meteorology
- Knowledge of random signal theory in the analysis of radar systems using signal theory techniques
- Ph. D. in engineering, physical sciences or mathematics

Marsha Hanson, X517

Outside Maintenance Worker - #2597

ADM - Physical Plant Services

Non-exempt range 28: \$1,156 - 1,498/month

DUTIES: Will perform necessary maintenance on the grounds, trails, parking lots, sidewalks and drives at NCAR sites: will remove snow and sand, sweep, pick up debris and trash, perform grading, trenching and backfilling as required and/or needed. Will water, mow, trim, feed and spray trees, shrubs and lawns as needed. Will perform preventive maintenance and minor repair to all equipment and assist in scheduling of same.

REQUIRES:

- High level skills in operation and maintenance of a 4-yard dump truck with spreader and snow blade and/or a 3-axle grader
- Good mechanical skills to maintain, operate and perform minor repairs on equipment (saw, snow blower, hydraulic equipment)
- Knowledge of safety procedures used in heavy equipment operation
- Knowledge of/skill in lawn, tree and native plant care
- Basic English skill to read and understand maintenance manuals, communicate effectively with others and follow directions
- Physical strength and stamina to work long hours in extreme weather conditions and to perform frequent heavy lifting
- Ability/willingness to work standby and/or overtime evenings and week-ends for snow removal and sanding operations
- Skill using judgment in prioritizing work within general guidelines
- Ability to qualify for and obtain a GSA driver's license and a State of Colorado "Class A" operator's license
- Demonstrated ability to maintain dependable work record

ALSO DESIRED, BUT NOT REQUIRED:

- Skill in operation and maintenance of additional mechanical equipment

Margareta Domecki, X581

Ph.D. Scientist I - II (1st or 2nd 3-year appointment) - #2601

HAO - Solar Variability Section

Exempt range 82: \$21,588 - 33,408/year
(1st 3-year appointment)
or 83: \$26,064 - 40,404/year
(2nd 3-year appointment)

DUTIES: Will conduct research on the theory of global fluid dynamics of the solar photosphere and convection zone, including development of theories of global convection, circulation, dynamo, and possible variations in solar energy output due to convection zone dynamics. The research strategy is expected to be the development of a succession of computer models of increasing physical realism taking place over a number of years. Will also consider how to incorporate into such models the global influences of small-scale dynamical processes on the sun, and will compare model results with relevant observations. Will interact significantly

with other Observatory staff and some efforts will be in formal collaboration with others.

REQUIRES (for I level):

- Ph.D. or equivalent with emphasis on theoretical fluid dynamics of relevance to astrophysics or geophysics
- Willingness to work on large, complex computer modeling problems
- Willingness to collaborate with other scientists in small group efforts

ALSO DESIRED, BUT NOT REQUIRED (for I level):

- Significant experience in computer assisted modeling of fluid dynamical problems
- Experience in solving solar fluid dynamical problems

REQUIRES (for II level):

- All requirements of I level plus several years postdoctoral research experience in astrophysical or geophysical fluid dynamics, including experience in computer assisted modeling

ALSO DESIRED, BUT NOT REQUIRED (for II level):

- Experience in solving solar fluid dynamical problems

Margareta Domecki, X581

Ph.D. Scientist I - II (1st or 2nd 3-year appointment) - #2610

HAO - Coronal/Interplanetary and Solar Atmosphere and Magnetic Fields Sections

Exempt range 82: \$21,588 - 33,408/year
(1st 3-year appointment)
or 83: \$26,064 - 40,404/year
(2nd 3-year appointment)

DUTIES: To carry out, in cooperation with other scientists at HAO, theoretical and interpretive research in solar physics with primary emphasis on descriptions of the magnetized plasma in the solar atmosphere. Attention will be directed particularly toward development of theories and physical models of plasma and hydromagnetic phenomena of the photosphere, chromosphere, corona, and interplanetary medium including time-dependent phenomena related to solar activity.

REQUIRES (for I level):

- Ph.D. or equivalent with training in magnetohydrodynamics or plasma physics
- Skill in working effectively with other scientists in collaborative projects
- Willingness to use a variety of techniques, both analytical and computer modeling, as needed in solving specific problems

ALSO DESIRED, BUT NOT REQUIRED (for I level):

- At least one year post-Ph.D. experience in carrying out independent research at a high level of creativity as demonstrated by published papers in the areas of MHD and plasma physics as applied to problems in astrophysics or space physics

REQUIRES (for II level):

- All requirements of I level plus at least three years of experience on the staff of a recognized research institution or university, in a position beyond the post-doctorate level
- A record of independent scientific research at

a high level of creativity as demonstrated by published papers in the areas of MHD and plasma physics

Margareta Domecki, X581

Ph.D. Scientist (1st 3-year term) - #2612

AAP - Large Scale Dynamics Section

Exempt range 82: \$21,588 - 33,408/year

DUTIES: Will conduct research on theoretical models, numerical and physical aspects of modeling, objective analysis and data initialization and diagnostic studies leading to a better understanding of large-scale atmospheric motions and to improvements in the accuracy and useful range of numerical weather forecasts.

REQUIRES:

- Ph.D. or equivalent in atmospheric science
- Minimum of 1-3 years research experience past Ph.D. in any of areas listed above including extensive use of high-speed, large-scale computer
- Demonstrated capability for originating and carrying out creative research of high quality as evidenced by specific research experience or publications
- Willingness/ability to supervise and direct the work of support scientists and/or programmers (1-3) to accomplish the research goals of the section; willingness/ability to hire/manage these people in ways consistent with NCAR's affirmative action plan and goals

ALSO DESIRED, BUT NOT REQUIRED:

- Strong background in geophysical fluid dynamics

Interested and qualified applicants should submit letter of intent, vita, salary history and requirements, publications list and 4 references (including addresses and phone numbers).

Marsha Hanson, X517

Staff Scientist I - #2606

AAP - Earth Radiation Budget Experiment

Exempt range 82: \$21,588 - 33,408/year

DUTIES: Will be a coinvestigator on the Climate Sections' ERBE team, with research activities primarily concerned with earth radiation budget. Using available radiation models, will analyze the spectral dependence of radiation budget for a variety of meteorological conditions. Will develop, if necessary, radiation models. Will compare model results with satellite radiation budget data and improve model parameterizations.

REQUIRES:

- Ph.D. or equivalent in physics, meteorology, or related atmospheric science with strong emphasis in atmospheric radiation
- Some experience with radiation models
- Willingness to collaborate with other scientists

ALSO DESIRED, BUT NOT REQUIRED:

- Experience or journal publications in atmospheric radiation

This position is expected to last 2 years and is contingent upon continued yearly NASA funding.

Margareta Domecki, X581

Support Scientist II - #2607

AAP - Earth Radiation Budget Experiment

Exempt range 81: \$17,820 - 26,748/year

DUTIES: Will assist in ERBE project that focuses on intercomparison between satellite measurements and the NCAR general circulation models (GCMs). Will assist in the development of radiation models; develop routines to run the models with observed data; maintain a variety of radiation codes. Write, document and maintain future codes. Will assist scientists in the use of various codes.

REQUIRES:

- M.S. or equivalent in atmospheric science
- High level FORTRAN programming skills
- Skills communicating effectively and ability/willingness to work cooperatively with other scientists

ALSO DESIRED, BUT NOT REQUIRED:

- Knowledge of/experience with atmospheric radiation
- Experience with GCMs
- Skill at handling large data sets

NOTE: This position is expected to last 4 years and is contingent upon continued yearly NASA funding.

Margareta Domecki, X581

Support Scientist II - #2608

AAP - Earth Radiation Budget Experiment

Exempt range 81: \$17,820 - 26,748/year

DUTIES: Will assist in studies of earth's radiation budget that focus on how clouds affect the energy budget. Work involves the development, documentation and maintenance of software to be used in the analysis of large satellite and meteorological data sets. Will assist in the development and testing of algorithms designed to retrieve cloud-cover from satellite sounder and high resolution scanner data. Write, document and maintain FORTRAN codes of these algorithms. Work may include the adaptation of FORTRAN codes for use on computer systems outside NCAR.

REQUIRES:

- M.S. or equivalent in meteorology or atmospheric science, but applied math, statistics, physics or astronomy will also be considered
- Solid skills programming in FORTRAN (about 2 years experience)
- Skills at manipulating very large data sets (about 1 year experience)
- Familiarity with elementary statistical analysis as acquired through either courses or work experience

This position is expected to last 4 years and is contingent upon continued yearly NASA funding.

Margareta Domecki, X581

Support Scientist II - #2609

HAO - Solar Terrestrial Data

Exempt range 81: \$17,820 - 26,748/year

DUTIES: To collect, survey, correct, and analyze existing solar data chronologies needed by the HAO research programs in solar variability. The chronologies of particular interest are records of sunspot numbers, areas, and positions, historical solar diameter data, auroral records and geomagnetic activity records.

REQUIRES:

- B.S. in physics or astronomy, or equivalent
- Substantial skill in FORTRAN programming
- Specific experiences in correlations and spectral analysis of noisy time series
- Ability to organize archival material
- Willingness/ability to collaborate with HAO scientific staff on contemporary research projects
- Effective and clear writing skill

ALSO DESIRED, BUT NOT REQUIRED:

- Knowledge of basic solar physics and the solar parameters typically measured on a routine basis throughout the world
- Familiarity with library resource materials and solar research periodicals, and proficiency in library research

NOTE: This position has a term of 2 years and is expected to last through September 1982.
Margareta Domecki, X581

TEMPORARY, FULL-TIMEAdministrative Secretary - #2617

HAO

Non-exempt range 26: \$956 - 1,238/month

DUTIES: Will provide secretarial support to the Section Head and general secretarial support to all members of the Section. Will establish and maintain all files, maintain appointment schedules, arrange meetings, handle travel arrangements, authorizations and vouchers; will assist in preparation of reports and scientific papers, prepare drafts and final copies of correspondence from written or transcribed material primarily using computer-assisted word processing equipment.

REQUIRES:

- Thorough knowledge of current office practices and procedures
- Thorough knowledge of English grammar, punctuation, spelling and composition
- Accurate typing skill at about 60 WPM (test may be given)
- High level skill in organizing work and establishing work priorities
- Skill in accomplishing several tasks simultaneously with many interruptions and under time deadlines
- Skill in dealing effectively and cooperatively with many individuals
- Skill in handling confidential information
- Skill in transcribing from dictaphone

--Ability/willingness to work infrequent overtime

--Ability/eagerness to learn about word processing and related computer equipment

This position is expected to last 4-5 months beginning about 10 November 1980.
Marsha Hanson, X517

Clerk I - #2616

HAO

Non-exempt range 22: \$653-847/month

DUTIES: Will provide clerical support to scientific and technical staff. These clerical duties may include such things as: sorting, forwarding and sending mail, arranging mailbox area, performing key operator functions for copy machine, keeping supply room stocked and organized, collecting and mailing time cards, filing, answering phone, typing telephone list, copying, maintaining kitchen area and running miscellaneous errands.

REQUIRES:

- Moderate skill in using initiative and following procedures within specific guidelines
- Moderate organizational skills in setting and accomplishing work priorities
- Moderate skill in working independently
- Moderate skill in communication
- Possession of valid Colorado driver's license and ability to obtain GSA license (requires no more than 2 moving violations in the last 3 years)

ALSO DESIRED, BUT NOT REQUIRED:

- Some knowledge of office practices and procedures
- Typing at about 35-40 WPM

This position is expected to last 4-5 months beginning about 15 October 1980.
Marsha Hanson, X517

CASUAL (ON CALL AS NEEDED)Security Guard - #2576

ADM - Safety and Security

Non-exempt range 25: \$5.01 - 6.50/hour

DUTIES: To protect buildings and contents against loss by fire, theft and illegal entry. Make inspection trips by foot and vehicle; serve on fire brigade and render first aid when necessary; operate two-way radio and paging system; receive NCAR telephone calls during non-business hours.

REQUIRES:

- Demonstrated strength and stamina to make required rounds, move fire equipment, and work alone in isolated areas
- Demonstrated skill in communicating effectively with a wide range of people and using good judgment
- Skill in remembering and following procedures

- Possession of a valid driver's license and ability to qualify for and obtain GSA driver's license (to qualify one cannot have more than 2 moving violations in last three years)
- Ability to qualify for and obtain American Red Cross Standard first aid certificate
- Flexibility/willingness to work on call as needed
- Experience as a security guard, law enforcement officer or military person

Margareta Domecki, X581

Student Assistant - #2615

CSD

Hire-in salary: \$5.30/hour

DUTIES: Will run, modify, maintain and write FORTRAN programs of varying difficulties on the CDC 7600 and VAX 11/780 (a large interactive mini-computer). Will also perform data reduction including the tabulation and plotting of aircraft and radar data pertinent to observational studies of convective clouds.

REQUIRES:

- Full-time student status in engineering, physical science, computer science or math, preferably at the junior level or higher
- Demonstrated proficiency in FORTRAN programming (high level skill shown in at least 2 programming classes, 1 of which dealt with FORTRAN)
- Demonstrated high level skill in math through calculus (at least 1 semester and preferably 2 or 3)
- Willingness/ability to do tedious and detail work accurately (i.e. tabulations, plotting graphs, digitizing)
- Skill in working independently and reliably
- Willingness/ability to work 15-20 hours/week during the academic year and full-time during summers and vacations (majority of hours should be between 8-5, Monday-Friday)

Marsha Hanson, X517

CALENDAR NOTES

October 13 through October 20, 1980

MONDAY, October 13

- Meeting -- UCAR Board of Trustees
9:00 a.m. through 12:00 noon Tuesday
Fleischmann Building, Roberts Seminar Room

TUESDAY, October 14

- Meeting -- UCAR Members' Representatives
1:00 p.m. through 12:00 noon Wednesday
NCAR Mesa Lab

WEDNESDAY, October 15

- Meeting -- RAF Advisory Panel
1:00 p.m. through 5:00 p.m. Thursday
NCAR Mesa Lab, Damon Room

THURSDAY, October 16

- HAO Seminar -- A Determination of the Solar
Wind Angular Momentum Flux Using Helios Data,
Vic Pizzo, HAO
3:30 p.m.
NCAR Mesa Lab, Main Seminar Room

FRIDAY, October 17

- ACAD Special Seminar -- Atmospheric Science
Research in China, John W. Winchester, Florida
State University
11:00 a.m.
NCAR Mesa Lab, Main Seminar Room

MONDAY, October 20

Open

Calendar Notes announcements may be mailed to
Vonda Giesey, ML 136. Wednesday at 12:00 noon
is the deadline for items to be included in the
Calendar Notes.