Students Take Research to the Skies with RAF

Whisking through an ice-laden cloud is not a standard part of university curricula. However, if you’re a graduate student in meteorology interested in field research, the idea makes sense.

Thirteen visitors from the University of Nevada–Reno (UNR) have just wrapped up two weeks at NCAR’s Research Aviation Facility (RAF). They’re the first participants in a program designed to give students hands-on training in airborne data collection. While UNR is the only school involved so far, success may attract the interest of other institutions—and could extend the program beyond aircraft to other research tools.

“There is a dearth of instrumentation teaching activities at the universities,” says John Hallett, a professor at UNR and member of the associated Desert Research Institute (DRI). Last year, Hallett and some other atmospheric scientists discussed that situation. As they saw it, graduate students were getting plenty of “book knowledge” and computer time, but little experience in the grittiness of research fieldwork.

Hallett contacted NCAR director Bob Serafin and asked for suggestions on how students might be introduced to the latest in research technology. After a lengthy approval process (“It was no small hassle getting funded,” says Hallett), the result was NCAR’s allocation of RAF facilities for an initial project. The RAF commitment of 17 hours for the Electra (at $1,800 an hour) represents about 10% of the plane’s yearly flight time. Food, housing, and other local expenses were paid for through the Advanced Study Program, and student stipends were covered by DRI.

The 11 students who visited RAF are all enrolled in Hallett’s course on atmospheric instrumentation. At NCAR, they’ve had several briefings from RAF project coordinator Allen Schanot and senior scientist Al Cooper on the logistics of in-flight
measurement. Also assisting is Jim Hudson, another UNR faculty member and DRI researcher. The students will earn either two or three credits for their NCAR visit, depending on the extent of their after-flight reporting and research. "If all goes well," says Hallett, "we may even get one or two publications out of the project." Of course, the visitors couldn't let their other course work slide. Reported Hallett midway through the RAF visit, "One guy just had his class notes faxed to him from Reno."

"Diverse" is an apt adjective to describe the students' backgrounds. Their nationalities span the globe, from China to Yugoslavia to Las Vegas. At UNR, all are working on master's or doctoral degrees with a microphysical emphasis. Their projects—looking at ozone, cloud nuclei, or boundary-layer winds—tie in well with observations the students collected on board NCAR aircraft.

The students' first flight, on 17 October, took them into a stratus deck that was dropping snow along the Front Range. "It was a good precipitation event," says Hallett. With icing conditions present, though, "we went up and down quite a bit," dodging hazards. A fair-weather flight later that week proved ideal for studying thermals (rising plumes of air) and the inversions that often trap Denver-area pollution near the ground.

"It was great having the live computer on the plane," says Brian Queen, a California native studying radiative processes as part of his M.S. Each student aboard the Electra had access to a terminal displaying temperature, moisture, and other data in raw form only seconds after their measurement. Larger computers at the RAF ground site gave the students a chance to analyze their data on non-flight days. Says Belay Demoz, an Ethiopian Ph.D. student working on precipitation studies, "We really got a lot of help from RAF. They were very patient with us."

One challenge facing the group—and atmospheric science in general—is the impact of research aircraft on the very observations they make possible. "I'm doing electric fields," says Hallet of his own research. "The P3 and the Electra self-charge when they take off [much as shuffling one's feet on a carpet can do]. This has certain effects when we try to measure ambient electric field." Also, airflows are distorted along the body of the
aircraft, which can jeopardize the accuracy of wind readings and other parameters. "This is becoming a hot topic," says Allen. "We're changing the way we mount some instruments on the NCAR aircraft [because of the distortion]."

Hallett is now writing an article for the Bulletin of the American Meteorological Society on his students' RAF visit. "We've got to bring our young people into this," he says, but how that will be done is "not at all clear." No extension of the program is yet in place. Hallett's view of the ideal arrangement would be for several universities with strong atmospheric-instrumentation programs to send their best students to RAF for training.

"Someone could do the same kind of thing with radar or the surface observational networks. This should be highly cost-effective in the long term," says Hallett. "We are training good students who are going to be the leaders of the profession in 10 or 15 years. How can we not do this?" •BH

Robot Retriever Gives SCD A Break

With 67,000 cartridges of data on hand, the Scientific Computing Division welcomes all the storage help it can get. This week, the latest SCD assistant made its debut. It's a robot (the StorageTek 4400 Automated Cartridge System) that stores and retrieves data on cartridges within the system. "It holds about a terabyte [one trillion bytes] worth of information," says Bob Niffenegger, operations manager for SCD. Frequently used data will go from the disk farm to the robot's storage before eventual consignment to archives. Though the retriever works inside a "great big gray box," a monitor in the SCD lobby will soon be transmitting live pictures of the robot in action for visitors and curious staff. Pictured are Jeff Bonds (left) and Michael Van Buskirk of StorageTek during assembly. (Photo by Bob Bumpas.)
Donations to the United Way campaign now under way at NCAR help support more than 50 human-service agencies and programs in Boulder County. A number of NCAR staff choose to contribute time as well as money, putting in regular hours for United Way beneficiaries. Below is a profile of Craig Kunitani, one of those volunteers. *BH

“I wanted to put something back into the community,” says Craig Kunitani of his three years as a Big Brother. For Craig, giving time to a specific youngster is a satisfying way to accomplish that goal. “I also wanted to put some of myself into it, and to do something I’d enjoy. It’s been a lot of fun for me as well as for my ‘little’.”

Craig’s “little” (a common term for children in the Big Brothers/Big Sisters program) is Maya, a 12-year-old girl. Volunteers are usually paired with a child of their own sex, but the increase in single motherhood—and in the stress it can cause—has begun to change that tradition. “In our society, kids are usually more in need of male companionship,” says Craig. He and Maya have met several other Big Brother–little sister pairs in the Denver area.

“Our match has worked out really well,” Craig says. “I think both of us have gotten something out of it.”

To minimize the risk of an inappropriate pairing, both volunteer and client go through extensive screenings at the Big Brothers/Big Sisters office. Children accepted into the program are normally 5 1/2 to 13 years old for Big Brothers clients and 8 to 15 in Big Sisters. Youngsters with physical or mental disabilities are often accepted, and many thrive in the program.

The matching process itself is “sort of like computer dating,”” jokes Craig. “It’s up to the program counselors to decide what people will be good matches.” Written profiles of a potential “big sibling” are shown first to the parent, then to the child, before a first meeting is scheduled. If all parties involved find the linkup a good one, the volunteer and child arrange to meet at least four hours weekly while checking into the program office for periodic evaluations.

Sunday mornings are the usual time for Craig and Maya to engage in activities ranging from meals out to bike rides. “She likes to see movies and go to McDonald’s,” says Craig. “I try to diversify it more.” Helping Craig do so are frequent events staged by Denver-area Big Brothers/Big Sisters chapters. Craig and Maya recently attended an appreciation lunch for volunteers and took in a judo demonstration.

Even volunteering for another group is fair game. Last Thanksgiving, Craig and Maya delivered dinners to homebound Boulder residents through the Meals on Wheels program, another United Way agency. “It’s a little different [from Big Brothers/Big Sisters],” says Craig, “because you serve a greater range of people. Some of the older clients were very cheerful and wished us a nice holiday. Others were more weary or scared. It was good for Maya,” Craig adds, as it helped “develop her sense of community.”

How would Craig respond if you asked him whether Big Brothers/Big Sisters would be worth your time? “Definitely. You get a real sense that you’re making an impact on someone’s life in a positive way.”
Announcements

New Staff

John Desanto, student assistant III with the Mesoscale and Microscale Meteorology Division. RL-6 room C134, ext. 8712.

Elisabeth Holland, scientist I with the Atmospheric Chemistry Division. ML room 251, ext. 1433.

Hanne Mauriello, secretary with UCAR. FW room 227, ext. 8470.

Theresa Murray, technical services librarian with Library and Information Services. ML room 237, ext. 1178.

Andrea Rashall, file clerk with the Research Applications Program. FW room 232, ext. 8420.

Mariana Vertenstein, programmer III with the Climate and Global Dynamics Division. ML room 314C, ext. 1349.

SCD Schedules New-User Orientations for November

The Consulting Office of the Scientific Computing Division will conduct new-user orientation sessions in November at the following times:

Tuesday 14 November 1:00-4:30 p.m.
Wednesday 15 November 8:30 a.m.–noon

The November classes will be held in ML room 22. Please register at least two days in advance. For more information, call the SCD Visitor and New User Information office, ext. 1225.

Mesa Lab Bank Closed Thursday and Friday

Today and tomorrow, staff of the Food and Conference Services office will be at a Macintosh seminar off site. There will be no banking services those two days. Staff will not be able to get petty cash or stamps or to cash personal checks.

Departures

Barbara Carpenter 20 October
Judy Cassidy 13 October

Visitors

—Guy Brasseur, Atmospheric Chemistry Division

—Victor Pizzo, High Altitude Observatory

Luther Carter, freelance journalist, Washington, D.C. Field of interest: Alternative energy sources. 24 October.
—Joan Vandiver Frisch, Media Relations

Runa Hellinga, Netherlands Press Association, Rotterdam. Field of interest: Environmental effects of climate change. 26 October.
—Joan Vandiver Frisch, Media Relations

—Patrick Zimmerman, Atmospheric Chemistry Division

Hans Schmit, ochtenblad Trouw, Amsterdam, the Netherlands. Field of interest: Environmental effects of climate change. 26 October.
—Joan Vandiver Frisch, Media Relations

—Frank Bryan, Climate and Global Dynamics Division

Marc van den Broek, de Volkskrant, Amsterdam, the Netherlands. Field of interest: Climate change. 26 October.
—Joan Vandiver Frisch, Media Relations

—William Holland, Climate and Global Dynamics Division
The following new acquisitions for the Mesa and branch libraries will be displayed in the Mesa Library through the dates listed above. They may be reserved during display for subsequent checkout. NCAR staff located off the mesa may borrow new books by checking the item(s) of interest below and sending this list to Faith Percell. Reference material, however, does not circulate.

**New Books**

**Aeronautics**


**Climatologists and Meteorology**


**Electrical Engineering**

Two-Dimensional Signal and Image Processing. Lim, J S. 1990. TK5102.5 L54 1990 in MAR.

**Engineering (General)**


**Fund Raising**


**Mathematics and Computer Science**


**Oceanography**


**Physics**


**Psychology**


**New Technical Reports**

**Atmospheric Science**


**Chemistry**


**Engineering, Technology**


**Oceanography**

24912.

24913.

24914.

24915.

Physics
24916.

Pollution
24919.

Recommendation for Library Purchase
Title: __________________________________________
Author: ________________________________ Publisher: _________________ Date: __________
For: Mesa _____ RL6 _____ RL3 _____ MAR _____ RAF _____ (please check one)
Name: __________________________________________
EMPLOYMENT PROCESS
PLEASE READ!

APPLICATION PROCEDURE: In order to be considered for employment at UCAR/NCAR you must apply for a specific position. Please indicate a job number and position title on your application. We only require that one application be completed. You may use this application to apply for all jobs in which you are interested. Submitting a completed application is very helpful; although, not absolutely necessary. You may also submit a resume and cover letter if you wish, but be sure you indicate the position(s) for which you are applying.

APPLYING FOR ANOTHER POSITION: Your application materials will be kept on file for one year. If you wish to be considered for another position during that time, you only need to call our office and ask to be considered. You may call our 24 hour jobline, 497-8707, to find out about all UCAR/NCAR positions open to the public.

NOTIFICATION OF APPLICATION STATUS: If you are applying for an exempt position, we will notify you as to the status of your application as soon as it can be determined. If you are applying for a non-exempt position, you will be notified within three weeks after the position closes, only if we wish to interview you. Normally, a position closes after sufficient applications have been received. When a position closes, it will no longer appear in Staff Notes or be announced on the jobline.

MORE INFORMATION ON SPECIFIC OPENINGS: You may obtain copies of previous "Job Openings" ads at the UCAR/NCAR Personnel Office, located at 3215 Marine Street, Boulder.

NCAR/UCAR EMPLOYEE APPLICATIONS: If you are a UCAR/NCAR employee and wish to be considered for any of the positions listed, please complete an employee application (available from Personnel Services, x8713), attach a resume, and return it to Personnel Services, RL6.

ADMINISTRATIVE SECRETARY - #1151
CGD - Interdisciplinary Climate Systems
Non-Exempt Range: 27, $1,472 - 1,912/mo
DUTIES INCLUDE: Provides secretarial and clerical support to the CGD Staff Assistant and the Head of the Interdisciplinary Climate Systems Section. Word processes and proofreads manuscripts, reports, correspondence, and lectures; conducts library and scientific reference searches; handles routine correspondence to reviewers and authors of scientific journal; maintains scientific journal log; performs general secretarial duties such as photocopying, answering phones, filing, distributing mail, and updating mailing lists; makes travel arrangements; handles logistics for seminars, conferences, and workshops; develops and manages databases; and acts as backup in the absence of the staff assistant.

REQUIREMENTS INCLUDE:
-- Thorough knowledge of English grammar, spelling and syntax
-- Skill at accurate typing of 70 wpm
-- Skill in transcribing machine dictation
-- Skill in word processing and data base management
-- Skill in paying attention to detail
-- Skill in working on several tasks simultaneously and meeting deadlines
-- Skill in prioritizing workload

Please note: This position is for a term up to September 30, 1990 with possibility of extension.
Anna Reyna-Arcos

DIRECTOR, ATMOSPHERIC CHEMISTRY DIVISION - #1118
Exempt Range: 67, $5,720 - 8,580/mo
DUTIES INCLUDE: Responsibility for the overall scientific productivity, creativity, and excellence of the division; for the formulation and execution of both long-range and short-range plans within the NCAR guidelines for management of the laboratory; for the quality of the scientific and support staff; for personnel management, including supervising employees in ways consistent with NCAR's equal employment opportunity and affirmative action plans; planning and manage-
ment of budgets and other resources; and
development of new funding sources to
support the scientific goals of the
division. In addition, the Director is
responsible for program advocacy in a
number of forums, including government
agencies, UCAR member institutions, and
the scientific community. As a member of
the NCAR Director's Committee, the ACD
Director shares in NCAR management
deliberations, advising the Director of
NCAR on such matters as scientific goals
and standards, policies, and programs.

REQUIREMENTS INCLUDE:
-- Ph.D. in any of the biological, envi-
ronmental or physical sciences, OR the
equivalent combination of education
and experience
-- International recognition as a
scientific leader in atmospheric
chemistry and/or related areas, as
demonstrated by a research record of
considerable depth and breadth
-- Skill in the area of scientific
advocacy to effectively and persua-
sively promote goals and strategies
for supporting the mission of ACD's work
with NCAR, UCAR, funding agencies and
the general scientific community
-- Demonstrated scientific acumen and
leadership skills associated with the
development of scientific programs
-- Demonstrated leadership skills in
directing, developing and evaluating a
staff with widely varying backgrounds
and experience
-- Demonstrated skills in budget
development, resource development,
planning and utilization, and related
management/administrative functions
-- Demonstrated skills in planning and
leading diverse and coherent
scientific programs
-- Demonstrated skills in identifying
problems or potential problems, and in
recommending, promoting, and imple-
menting effective and creative
solutions

Searl Brier

DIRECTOR OF DEVELOPMENT - $1158

UCAR - Office for Industrial Relations
and Technology Transfer
Exempt Range: 64, $4,607 - 6,910/mo
DUTIES INCLUDE: Responsible for all
aspects of planning, organizing, and
directing a development program for UCAR.
Interacts with scientists and managers of
UCAR to generate private support for
capital needs and an endowment for UCAR's
science and technology program. Will
develop a program of fund raising, and a
list of prospects including individuals,
corporations, and foundations. Will

track the status of individual initia-
tives. Will establish a corporate office
which is responsible for coordinating
UCAR personnel resources; and management
of prospective donors; corporations,
foundations, and possibly government
agencies. Will supervise employees in
ways consistent with UCAR policies
concerning equal employment opportunity
and affirmative action.

REQUIREMENTS INCLUDE:
-- Demonstrated skill as a developmental
officer with a record of success in
fundraising and institutional advance-
ment
-- Skill in successful iteration with
high level scientific, administrative,
and corporate staff; both within and
outside the UCAR community
-- Skill in analyzing business and
financial plans
-- Demonstrated oral and written
communication skill
-- Demonstrated negotiation skills -
skill in guiding a prospective donor
to a specified project
-- Skill in coordinating interactions
between UCAR personnel resources and
potential donors. This entails
awareness of and sensitivity to
interests and tastes of potential
donors and UCAR personnel so that
productive matches can be made
-- Knowledge of and appreciation for
science and its purpose
-- Skill in using enthusiasm and
assertiveness to promote an idea or
product
-- Skill in envisioning, planning, and
executing a new activity or program
-- Skill in making strong presentations
and in justifying their substance in
detail

Becky Campbell

DIVISION DIRECTOR, HIGH ALTITUDE
OBSERVATORY - $1149

*PLEASE NOTE: This position is now
open to all interested applicants.*

Exempt Range: 67, $5,720 - $8,580/mo
DUTIES INCLUDE: Responsibility for
providing direction and leadership to a
broad program of research activities in
solar physics and related areas that draw
upon knowledge from laboratory studies,
test the generality of concepts in the
broader context of astrophysics, and
follow the effects of the varying solar
output on the terrestrial environment.
Accountable for the scientific crea-
tivity, productivity, and excellence of
the institution. Leads the staff in
formulating and implementing scientific
plans and priorities and is responsible for effective management of the Observatory, for the selection and development of quality scientific and support staff, for personnel management, including supervising employees in ways consistent with NCAR’s Equal Employment Opportunity and Affirmative Action Plans, and for the planning and management of budgets and the allocation of resources. The Director interacts with individuals and institutions throughout the scientific community as an advocate of the Observatory's program of solar-astrophysical and solar-terrestrial research.

REQUIREMENTS INCLUDE:

-- Ph.D in an appropriate physical science, OR the equivalent combination of education and experience

-- International recognition as a scientific leader in solar and solar/terrestrial physics and/or related areas, as demonstrated by a research record of considerable depth and breadth, sufficient to qualify as a senior scientist at NCAR

-- Skill in the area of scientific advocacy to effectively and persuasively promote goals and strategies for the advancement of the Observatory's work with NCAR, UCAR, funding agencies, and the general scientific community

-- Demonstrated scientific acumen and leadership skills associated with the development of scientific programs

-- Demonstrated leadership skills in directing, developing, and evaluating a staff of widely varying backgrounds and experience

-- Demonstrated skills in budget and resource development, planning and utilization, and related management/administrative functions

-- Demonstrated skills in planning and leading scientific programs that are similar to those of the High Altitude Observatory in terms of their diversity and their requirement of coherence and excellence

-- Skill in identifying problems or potential problems, and in recommending, promoting, and implementing effective and creative solutions

Searl Brier

R&D ENGINEER - #1157

ACD - Biosphere Atmosphere Interactions Project

Exempt Range: 58, $2,980 - $4,470/mo

DUTIES INCLUDE: Designs and constructs novel analytical instrumentation for use in flux measurements of methane from tropical rice paddies. Develops gradient and eddy correlation methods and hybrid techniques for the measurement of chemical flux. Develops and uses a conditional sampler and a real-time methane analyzer. Applies chemiluminescence in the measurement of trace reactive hydrocarbons from biogenic systems; and plans, conducts and coordinates detailed phases of research in a part of a major project. Provides advice/consultation to engineers, scientists, university staff and other agencies.

REQUIREMENTS INCLUDE:

-- Ph.D in chemistry OR the equivalent combination of education and experience with an emphasis on instrumental development of real-time measurement systems

-- Demonstrated skill in designing, building and deploying a mobile chemiluminescent instrument for the measurement of isoprene concentrations and fluxes in the biosphere

-- Demonstrated skill in chemiluminescence, and application of PMT's and related equipment

-- Demonstrated experience in field and aircraft measurement programs using real-time instrumentation in the analysis of reactive trace atmosphere species

-- Skill in working with gas correlation techniques

-- Skill in developing an analyzer to measure atmospheric methane flux from tropical rice paddies

-- Knowledge of enclosure and micro-meteorological based flux measurement techniques

-- Skill in publishing results in scientific journals and in writing grant proposals to government and non-government agencies

-- Skill in programming in FORTRAN

Searl Brier

ADDITIONAL POSITIONS

We are still accepting applications for positions listed below. For information on any of the following previously published job vacancies, please contact the Personnel/EOP office on extension 8713.

ADMINISTRATIVE ASSISTANT - #1154

MM - Director's Office

Non-Exempt Range: 29, $1,762 - $2,288/mo

Date first published in "Job Openings:"
October 12, 1989
ASSOCIATE SCIENTIST II - #1150
ACD - Biosphere-Atmosphere Chemistry Section
Exempt Range: 55, $2,393 - $3,590/mo (Level II)
58, $2,980 - $4,470/mo (Level III)
Date first published in "Job Openings:"
October 12, 1989

DOCUMENTATION GROUP HEAD - #1136
SCD - User Services
Exempt Range: 58, $2,980 - 4,695/mo
Date first published in "Job Openings:"
September 21, 1989

ELECTRONIC TECHNICIAN II/III - #1143
ATD - Research Aviation Facility
Non-Exempt Range: 29, $1,762 - 2,288/mo (Level II)
31, $2,139 - 2,778/mo (Level III)
Date first published in "Job Openings:"
October 5, 1989

ELECTRONIC TECHNICIAN III/IV - #1144
ATD - Research Aviation Facility
Non-Exempt Range: 31, $2,139 - 2,778/mo (Level III)
32, $2,349 - 3,051/mo (Level IV)
Date first published in "Job Openings:"
October 5, 1989

METEOROLOGIST/ASSOCIATE SCIENTIST II - #1155
MMM - Storm Project Office
Exempt Range: 55, $2,393 - $3,590/mo
Date first published in "Job Openings:"
October 12, 1989

PLUMBER - #1156
DIR - Physical Plant Services
Non-exempt Range: 32, $2,349 - 3,051/mo
Date first published in "Job Openings:"
October 12, 1989

SALAD AND SOUP PREPARER/CASHIER - #1145
DIR - Food Services
Non-Exempt Range: 24, $1,124 - 1,460/mo
HOURS: 6:30 a.m. to 3:00 p.m. or 7:00 a.m. to 3:30 p.m.
Date first published in "Job Openings:"
October 5, 1989

SCIENTIST I OR II - #1056
ACD - Atmospheric Chemical Modeling (ACM) Section
Exempt Range: 57, $2,773 - 4,160/mo
60, $3,440 - 5,160/mo
Date first published in "Job Openings:"
April 5, 1989

SOFTWARE ENGINEER II/III - #1133
ATD - Surface and Sounding Systems Facility (SSSF)
Exempt Range: 56, $2,573 - $3,860/mo (Level II)
58, $2,980 - $4,470/mo (Level III)
Date first published in "Job Openings:"
September 14, 1989

PART-TIME

SECRETARY - #1135
DIR - Advanced Study Program
Non-Exempt Range: 26, $675 - 876/mo (.5 FTE)
Date first published in "Job Openings:"
September 21, 1989

SECRETARY - #1153
MMM - Convective Meteorology
Non-Exempt Range: 26, $675 - 876/mo (.5 FTE)
Date first published in "Job Openings:"
October 12, 1989

TRAFFIC SERVICES CLERK - #1141
DIR - Administration
Non-Exempt Range: 27, $736 - 956/mo (.5 FTE)
HOURS: 20/week, 7:00 a.m. - 5:30 p.m. (Flexible)
Date first published in "Job Openings:"
September 28, 1989

STUDENT ASSISTANTS

STUDENT ASSISTANT II - #1138
HAO - Solar Maximum Mission
Flat Rate - $7.11/hr
Date first published in "Job Openings:"
September 28, 1989

STUDENT ASSISTANT II - #1140
ATD - Research Applications Program
Flat Rate: $7.11/hr
Date first published in "Job Openings:"
September 28, 1989
INO has been created to assist the Navy in achieving the most effective capability possible in forecasting the global ocean environment in which the fleet operates. INO is conducting R&D on ocean prediction systems for basin prediction of ocean structure and its acoustic implications. INO carries out and conducts scientific research programs in collaboration with and support of university and other research laboratories.

On October 1, 1989 INO became an integral part of the new Naval Oceanographic and Atmospheric Research Laboratory (NOARL). This Navy laboratory performs integrated research and development in ocean science, ocean acoustics, atmospheric science, and related technologies to improve and support Navy systems and operations.

INO is currently seeking persons for the following positions:

ASSOCIATE SCIENTISTS

DUTIES INCLUDE: Data gathering and reduction; analysis and interpretation; conducting and documenting scientific research on various aspects of data assimilative primitive equation ocean circulation models, collaboration with INO scientists engaged in constructing nowcasting/forecasting numerical ocean models.

REQUIREMENTS INCLUDE:
-- M.S. in Physical Oceanography, Ocean Engineering, Meteorology, Mathematics, or related science or equivalent combination of education and experience
-- Skill in data acquisition, processing and analysis in statistical analysis and numerical techniques for oceanographic, atmospheric or marine research activities
-- Demonstrated skill in writing and modifying computer programs in FORTRAN or C

SCIENTIFIC PROGRAMMER

REQUIREMENTS INCLUDE:
-- M.S. or B.S. in Computer Science
-- Skill in programming technical applications and databases
-- Skill in working in VAX and supercomputing environments
-- Skill in working with VMS or UNIX operating system

To apply for positions at INO, qualified applicants should submit resumes to: Newton Spitzfaden, INSTITUTE FOR NAVAL OCEANOGRAPHY, Building 1103, Room 233, Stennis Space Center, MS 39529-5005.

* Asterisked positions are appearing in "Job Openings" for the first time.
**Calendar**

6 November through 13 November 1989

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Monday, 6 November</td>
<td>OPEN</td>
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<tr>
<td>Tuesday, 7 November</td>
<td>* CGD Seminar -- Recent Climate Modelling Activities at BMRC -- Bryant McAvaney, BMRC, Melbourne, Australia 3:30 p.m. NCAR Mesa Lab, Main Seminar Room</td>
</tr>
<tr>
<td>Wednesday, 8 November</td>
<td>OPEN</td>
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<tr>
<td>Thursday, 9 November</td>
<td>OPEN</td>
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<tr>
<td>Thursday, 9 November (Continued)</td>
<td>• MMM/ATD Seminar -- Preliminary Development of Two New Instruments for Atmospheric Research: 1) A non-wetting, airborne thermometer with fast response 2) A high-volume precipitation spectrometer -- Paul Lawson, MMM/ATD 3:30 p.m. RL-6, Main Seminar Room, W-179</td>
</tr>
<tr>
<td>Friday, 10 November</td>
<td>OPEN</td>
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<tr>
<td>Monday, 13 November</td>
<td>OPEN</td>
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</tbody>
</table>

Friday, 10 November

- CGD Seminar -- *Diapycnic Mixing and Meridional Transports: The Indian Ocean* -- Eric B. Kraus, Pagosa Springs, Colorado 10:30 a.m. NCAR Mesa Lab, Main Seminar Room

Calendar announcements may be mailed to the Conference Office, ML 140. Tuesday at 5:00 p.m. is the deadline for items to be included.