

Positions Available

R&D IN MATERIALS TECHNOLOGY

**Rockwell International Corporation's
Science Center in Anaheim, CA**

The Science Center, Rockwell's Corporate Research Laboratory, invites applications for a position at its Anaheim location in research and development of silicon and other materials, mainly for advanced electro-optical device applications.

Requirements for this position include a Ph.D. or equivalent expertise in solid state physics or materials science with a strong emphasis on material preparation and characterization.

This position will center upon development of techniques for advanced thin semiconductor film growth and characterization. Well equipped facilities include several types of epitaxial film growth systems and a cryogenics laboratory for measurement of optical and transport properties of materials.

Rockwell offers excellent salaries and one of the finest benefit packages in the industry, including relocation assistance. For consideration, please send your resume to: Professional Staffing (AQ-8), Rockwell International Science Center, 1049 Camino Dos Rios, Thousand Oaks, CA 91360. Equal Opportunity Employer M/F.



Rockwell International

... where science gets down to business

**PERMANENT STAFF POSITION
Condensed Matter Theory
Sandia National Laboratories
Livermore, California**

A staff position is available in the Theoretical Division for a condensed matter theorist. The candidate is expected to perform vigorous independent research relevant to problems in materials science and to actively collaborate with outside researchers through Sandia's visiting scientist program. Current research in the division involves the structure, dynamics and thermodynamics of intrinsic defects, surfaces and grain boundaries using both *ab-initio* and semi-empirical techniques. On-site facilities include two Cray 1s and one Cray XMP24 computer. Applicants should send a resume including three references and uncertified copy of transcripts to Personnel Division 8522-B, P.O. Box 969, Sandia National Laboratories, Livermore, CA 94550.

Sandia is an affirmative action/equal opportunity employer. U.S. citizenship is required.

**POSTDOCTORAL POSITION
Condensed Matter Theory
Sandia National Laboratories
Livermore, California**

A postdoctoral research position is available in the Theoretical Division for a condensed matter theorist. The candidate will contribute to the current research in the division involving the structure, dynamics, and thermodynamics of intrinsic defects, surfaces and grain boundaries using both *ab-initio* and semi-empirical techniques. On-site facilities include two Cray-1s and one Cray-XMP24 computer. Applicants should send a resume including three references and uncertified copy of transcripts to Personnel Division 8522-B, P.O. Box 969, Sandia National Laboratories, Livermore, CA 94550.

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ASSOCIATE CHEMIST

Will develop force fields for materials science & biotechnology by fitting force field expressions to geometries and force matrices obtained from *ab initio* wave functions. Will collaborate with experimental spectroscopists to apply theoretical results to large molecules. Reqs PhD in physical chemistry with 2 yrs postdoctoral exp in spectroscopy and theoretical chemistry plus 1 yr exp in modern experimental spectroscopy and 1 yr exp in fitting force fields to experimental and theoretical data. Strong bkgd in chemistry & molecular physics with a good understanding of electronic & vibrational wavefunctions is essential. Starting salary approx \$2,500 per month. Position location in Pasadena, California. If hired, verification of identity and work eligibility will be required. Please send resume to: Caltech, Supervisor of Employment, Position CD01, Pasadena, CA 91125.

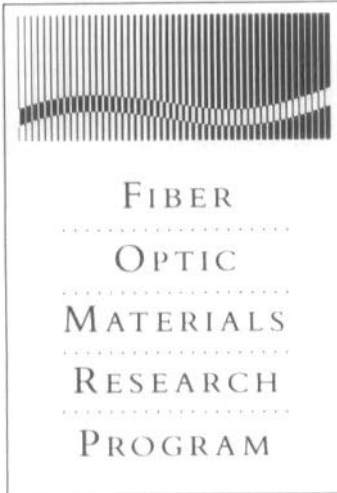
*Affirmative Action/
Equal Opportunity Employer.
Women and minorities are encouraged to apply*

**DIRECTOR
Materials Science Center
Princeton University**

Princeton University seeks a Director for its new Materials Science Center, which will be housed in a new building and in the laboratories of existing departments. The Center's goals are the design and study of materials based on the prediction and fundamental understanding of properties in their relation to composition and structure. Because its program will have a strong component in the theory of materials, the director can be a theoretician and/or an experimentalist. The director will be a distinguished researcher with a faculty appointment in one of the participating departments. Send nominations and inquiries by August 1, 1988 to A. Navrotsky, Chairman of the Materials Science Search Committee, Dept. of Geological and Geophysical Sciences, Princeton Univ., Princeton, NJ 08544; telephone (609) 452-4674

*Princeton University is an
Equal Opportunity/Affirmative Action
Employer*

Positions Available



FIBER OPTIC MATERIALS RESEARCH

Rutgers, the State University of New Jersey, is seeking exceptional candidates for two tenure track faculty positions available September 1, 1988 at the Assistant and Associate Professor level respectively. These positions involve both teaching and research as well as expertise in the following areas.

- Optical Materials Synthesis and Processing
- Glass Characterization
- Fiber Drawing and Coating
- Optical and Laser Spectroscopy
- Fiber Devices and Applications

A doctorate is required as well as a demonstrated record of research activity and publications in one or more of the designated areas. Excellent salaries and benefits are available to qualified candidates. Applicants should send curriculum vitae, publication list and the names of three references to: Dr. George H. Sigel, Jr., Director, Fiber Optic Materials Research Program, Rutgers University, PO Box 909, Piscataway, NJ 08855-0909.



Rutgers University is an Affirmative Action/Equal Opportunity Employer

DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING University of Florida

THREE TENURE TRACK FACULTY POSITIONS are available for qualified individuals with expertise in one or more of the following areas of materials science and engineering:

- a. Theory and practice in the application of electron-optical devices for the characterization of materials;
- b. Mechanical behavior of ceramics, intermetallics, composites and/or other brittle materials;
- c. Solidification processing of materials, including rapid solidification processing, crystal growth and/or metal matrix composites.

A doctoral degree in materials science and engineering or a related discipline will be required for consideration. Candidates will be expected to develop undergraduate and graduate courses as well as initiate and sustain sponsored research in their area of expertise. Positions may be offered at the level of assistant, associate or full professor depending upon the qualifications of individual candidates.

The Department of Materials Science and Engineering at the University of Florida currently has 24 faculty, 150 undergraduate and 100 graduate students, with substantial and sustained research funding and academic programs in ceramics, electronic materials, metals and polymers.

Deadlines for submission of applications for these positions are July 1, September 1, and November 1, 1988.

Please send a curriculum vitae, list of publications, three letters of recommendation, and a statement of research interests to: Dr. R. T. DeHoff, Chairman of the Search Committee, Department of Materials Science and Engineering, University of Florida, Gainesville, FL 32611

The University of Florida is an Equal Opportunity/Affirmative Action Employer

POSTDOCTORAL ASSOCIATE

Seeking a postdoctoral associate to investigate nonradiative recombination enhanced dislocation motion in alloy semiconductors. If interested, please send your resume and list of references to: Prof. S. Mahajan, Department of Materials Science, Carnegie Mellon University, Pittsburgh, PA 15213; (412) 268-2702.

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Positions Available



FACULTY
POSITIONS IN
MATERIALS
SCIENCE
UNIVERSITY
OF DELAWARE

A tenure-track position in Materials Science is available. The Materials Science Program at Delaware is an interdepartmental degree-granting graduate program (M.S. and Ph.D.). The appointment is in the Department of Chemical Engineering and may be filled at any level. Preference will be given to candidates with research interests in technologically advanced materials. Duties include the teaching of undergraduate and graduate courses in materials and the development of a strong independent research program. Teaching in the area of specific materials expertise and in thermodynamics is expected. Materials research and teaching programs at Delaware include all major classes of materials.

Additional resources and interactions are available with the Institute of Energy Conversion (photovoltaic materials), the Center for Composite Materials and the Center for Catalytic Science and Technology, all of which have large block funding. Applicants should send resume, list of publications, a brief summary of research avenues, and names and addresses of three references to: Prof. Jerold M. Schultz, Chairman, Materials Science Program, Colburn Lab, UNIVERSITY OF DELAWARE, Newark, DE 19716 by June 15, 1988.

The University of Delaware is an Equal Opportunity Employer which encourages applications from qualified minority groups and women.

Coming in June

Guest Editor Jan F. Herbst of General Motors Research Laboratories leads a focus on magnetism and magnetic materials:

- High Resolution Imaging of Magnetization by D.T. Pierce, J. Unguris, and R.J. Celotta (National Bureau of Standards)
- Magnetism in the High T_c Superconductors by S.K. Sinha (Exxon Research and Engineering Company)
- MBE of Magnetic Metallic Structures by G.A. Prinz (Naval Research Laboratory)
- Diluted Magnetic Semiconductors by N. Samarth and J.K. Furdyna (University of Notre Dame)
- Rapidly Solidified Neodymium-Iron-Boron Magnets by J.J. Croat and J.F. Herbst (General Motors)

Voice Choice

How is an article for scientific publication written? In such writing, a style of prose comprising constructions around intransitive verbs and verbs of passive voice is typically chosen. An impression of detached objectivity is thus conveyed. Whereas an impression of pseudo-intellectual affectation may be given to the lay reader, both credibility and humility are added for the technically aware. Active voice, if used at all, is confined to third-person, inanimate subjects. Also, superlatives are often understated by authors (except in some publications where the obligatory word "first" must adorn the abstract and first paragraph). Without the measured, low-key, matter-of-fact style, an impression of emotional subjectivity and pomposity would surely result.

How do we learn this? We imitate this style in the literature. Our professors and senior co-authors teach it to us informally. Courses and texts on scientific writing even give us a rationale to choose the detached voice. They explain that the choice "depends on whether one wishes to feature the agent or the action, the operator or what is operated on. The passive voice is often preferred [when] the operator is a physical but lifeless agency. Technical writers are often confirmed users of the passive voice because they wish to emphasize the what and the how rather than the who. Unfortunately, however, this can be done so as to show ... 'vacated responsibility.'"¹ Is it not intriguing how the same data described passively sports greater credibility than if done actively?

"The superconducting transition temperature was found by resistance measurement to be 98 K. The nature of the transition was confirmed by observing the Meissner effect." Why not: "With great anticipation, we measured the resistance as a function of decreasing temperature and discovered to our immense surprise and glee that the sample began superconducting below the unbelievably high temperature of 98 K. After we anxiously checked that the leads were still attached to the sample and that the voltmeter was indeed still working, we first celebrated exuberantly and then, fearing that resistance alone would not convince the skeptics of the world, we looked for and found a healthy Meissner effect to confirm our discovery. Hooooray!" The more expressive choice of voice and accompanying emotional modifiers may be a less efficient use of language for communicating the essential data, but has far greater potential for involving the reader in the discovery.

The scientific method dictates that all relevant parameters and assumptions be stated clearly and fully so that other independent experts can repeat and corroborate the results. This is a stringent and uncompromising tradition to which we must all adhere. But must we also be dry, abstract, humorless, and boring in the way these essentials are delivered? Perhaps yes and perhaps no. Peppering text with irrelevant hyperbole certainly does make it more difficult to find and extract only the salient aspects (not to mention making it harder to satisfy length restrictions of letter journals). But, adding a human flavor (in spite of the well-known rampant subjectivity to which humans are subject) may make our science more palatable and inviting to a wider readership.

The same texts that explain that passive voice is sometimes indispensable say: "Where directness is desired, use the active voice. Avoid passive constructions."² "[The science writer] will write positively, confidently. Unless he does, neither the editor nor the reader will be convinced that he has a story worth telling. He will write in the active voice, avoiding the slow and passive verbs."³ It isn't likely that the choice of passive voice really fools anyone anyway—if we imperfect humans are not the implied subjects then who did the work and who wrote the paper!

For the sake of efficiency and technical clarity, sticking to the traditional style for archival publication may indeed be best. However, let us not mistake the absence of evocative prose for the presence of credibility. And let's inject the human and exciting reasons we do science in the first place into our writings for more general consumption.

E.N. KAUFMANN

1. *Essentials for the Scientific and Technical Writer* by Hardy Hoover (Dover Publications Inc., New York, 1980) p. 121.
2. *Handbook for Authors of Papers in American Chemical Society Publications* (American Chemical Society, Washington DC, 1978) p. 23.
3. *Writing Science News for the Mass Media* by David W. Burkett (Gulf Publishing Co., Houston, 1973) p. 181.