

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

Science serves its readers as a forum for the presentation and discussion of important issues related to the advancement of science, including the presentation of minority or conflicting points of view, rather than by publishing only material on which a consensus has been reached. Accordingly, all articles published in *Science*—including editorials, news and comment, and book reviews—are signed and reflect the individual views of the authors and not official points of view adopted by the AAAS or the institutions with which the authors are affiliated.

Editorial Board

FREDERICK R. BLATTNER, BERNARD F. BURKE, ARNOLD DEMAIN, CHARLES L. DRAKE, ARTHUR F. FINDEIS, E. PETER GEIDUSCHEK, GLYNN ISAAC, NEAL E. MILLER, FREDERICK MOSTELLER, ALLEN NEWELL, RUTH PATRICK, BRYANT W. ROSSITER, VERA C. RUBIN, WILLIAM P. SLICHTER, SOLOMON H. SNYDER, PAUL E. WAGGONER, JOHN WOOD

Publisher: WILLIAM D. CAREY

Editor: PHILIP H. ABELSON

Editorial Staff

Assistant Managing Editor: JOHN E. RINGLE
Production Editor: ELLEN E. MURPHY
Business Manager: HANS NUSSBAUM
News Editor: BARBARA J. CULLITON
News and Comment: COLIN NORMAN (deputy editor), JEFFREY L. FOX, CONSTANCE HOLDEN, ELIOT MARSHALL, R. JEFFREY SMITH, MARJORIE SUN, JOHN WALSH
European Correspondent: DAVID DICKSON
Contributing Writer: LUTHER J. CARTER
Research News: ROGER LEWIN (deputy editor), RICHARD A. KERR, GINA KOLATA, JEAN L. MARX, THOMAS H. MAUGH II, ARTHUR L. ROBINSON, M. MITCHELL WALDROP
Administrative Assistant, News: SCHERRAINE MACK;
Editorial Assistant, News: FANNIE GROOM
Senior Editors: ELEANORE BUTZ, MARY DORFMAN, RUTH KULSTAD
Associate Editors: MARTHA COLLINS, SYLVIA EBERHART, CAITILIN GORDON, WILLIAM GREAVES, LOIS SCHMITT
Assistant Editors: STEPHEN KEPPLER, LISA MCCULLOUGH, EDITH MEYERS
Book Reviews: KATHERINE LIVINGSTON, *Editor:* LINDA HEISERMAN, JANET KEGG
Letters: CHRISTINE GILBERT
Copy Editor: ISABELLA BOULDIN
Production: JOHN BAKER, HOLLY BISHOP, ELEANOR WARNER, JEAN ROCKWOOD, SHARON RYAN, BEVERLY SHIELDS
Covers, Reprints, and Permissions: GRAYCE FINGER, *Editor:* GERALDINE CRUMP, CORRINE HARRIS
Guide to Scientific Instruments: RICHARD G. SOMMER
Editorial Administrator: SUSAN ELLIOTT
Assistant to the Associate Publisher: ROSE LOWERY
Assistant to the Managing Editor: NANCY HARTNAGEL
Membership Recruitment: GWENDOLYN HUDDLE
Member and Subscription Records: ANN RAGLAND
EDITORIAL CORRESPONDENCE: 1515 Massachusetts Avenue, NW, Washington, D.C. 20005. Area code 202. General Editorial Office, 467-4350; Book Reviews, 467-4367; Guide to Scientific Instruments, 467-4480; News and Comment, 467-4430; Reprints and Permissions, 467-4483; Research News, 467-4321. Cable: *Advancesci*, Washington. For "Information for Contributors," write to the editorial office or see page xi, *Science*, 29 June 1984.
BUSINESS CORRESPONDENCE: Area Code 202. Membership and Subscriptions: 467-4417.

Advertising Representatives

Director: EARL J. SCHERAGO
Production Manager: GINA REILLY
Advertising Sales Manager: RICHARD L. CHARLES
Marketing Manager: HERBERT L. BURKLUND
Sales: NEW YORK, N.Y. 10036: Steve Hamburger, 1515 Broadway (212-730-1050); SCOTCH PLAINS, N.J. 07076: C. Richard Callis, 12 Unami Lane (201-889-4873); CHICAGO, ILL. 60611: Jack Ryan, Room 2107, 919 N. Michigan Ave. (312-337-4973); BEVERLY HILLS, CALIF. 90211: Winn Nance, 111 N. La Cienega Blvd. (213-657-2772); SAN JOSE, CALIF. 95112: Bob Brindley, 310 S. 16 St. (408-998-4690); DORSET, VT. 05251: Fred W. Diefenbach, Kent Hill Rd. (802-867-5581).
ADVERTISING CORRESPONDENCE: Tenth floor, 1515 Broadway, New York 10036 (212-730-1050).

New Initiatives at NSF

Some of the new or expanded programs recently undertaken at the National Science Foundation are likely to have substantial effects on the development of science and technology. As one example, in 1985 NSF will begin support of university centers for cross-disciplinary research in engineering. This is in response to concern about the state of engineering research and training in our nation's colleges and universities. Computers, robotics, telecommunication, and information management have radically transformed engineering and manufacturing processes. But few university departments have the instruments required to provide hands-on experience for their students. Also, engineering practice has evolved into team attacks on problems, but university engineering research has remained the domain of small single-investigator programs. The new engineering centers program is a significant step toward improving the diversity and quality of engineering research and training.

Another NSF initiative concerns research equipment and instrumentation. At many colleges and universities, equipment is outmoded. For a decade prior to 1983, funds for buying equipment in NSF grants did not keep pace with the need. Increases in the 1984 budget have partially restored purchase of equipment to its place of importance in grants and university budgets. However, in many fields, academic science instrumentation still lags behind that available to industry or to the defense community. Continued emphasis on instrumentation will be required to undo a decade of neglect.

A third initiative at NSF involves supercomputing. In order to do first-rate research today, many scientists and engineers must have access to computers for modeling and data analysis. In a sense, supercomputers are a special subset within the whole problem of scientific instrumentation. We have been attacking the supercomputer problem in three ways. First, we support the research that scientists and engineers need to develop the most advanced computers. Second, in order to increase academic access to supercomputers, NSF has arranged for large blocks of supercomputer services at the University of Minnesota, Purdue University, and Boeing Computer Services and is offering these services on a competitive basis to scientists and engineers as part of their research grants. Finally, we intend to establish advanced computing centers throughout the country and to develop nationwide networks to allow research scientists to have access to a variety of supercomputer facilities.

My experience in Washington causes me to offer some parting advice to those involved in complex fields involving interdisciplinary research. In research fields that incorporate a number of different disciplines, it is especially important that investigators develop a clear-cut consensus as to what needs to be done and how to do it. This helps unify the research community, bringing developments in various disciplines to the scrutiny and attention of colleagues in other fields. This, in turn, builds bridges between disciplines and helps generate exciting new approaches to old problems. Carefully considered priorities also help decision-makers in the executive and legislative branches of government make the choices that affect scientific work and the health of the scientific community.

Finally, NSF should continue to emphasize that its role is the development and maintenance of the health of American science and engineering—a far bigger role than that of only a grant-making agency. The emphasis that has been placed on developing the entire university scientific system must be continued and expanded. We can only have scientific leadership if we train the best scientists; it is the people that count.—EDWARD A. KNAPP,* *Senior Fellow and Research Adviser, Los Alamos National Laboratory, Los Alamos, New Mexico 87545*

*Dr. Knapp served as director of the National Science Foundation from 3 November 1982 to 11 August 1984.