

NSF Panel Recommends Support for Atomic Resolution Microscopy

The U.S. effort in scanning tip and electron microscopies is inadequate and the level of support lags far behind the levels established for Europe and Japan. This is the recently published finding of the National Science Foundation Panel on Atomic Resolution Microscopy and an associated workshop.

The panel's report recommends a \$100 million commitment by NSF over five years for atomic imaging and manipulation (AIM). The panel also recommends that the National Research Council establish a national committee on AIM to provide oversight, monitoring, and reports.

The panel recommends (1) extending resolution to 1 Å and below; (2) developing a new generation of user friendly equipment; (3) capitalizing on the scanning tip science and technology base in the United States; (4) strengthening the U.S. electron microscopy technology base; (5) assessing the state of materials instrumen-

tation in the United States; (6) defining a national program in AIM; and (7) providing oversight and accountability.

The report defines a program covering scanning tip microscopies and atomic manipulation, electron microscopy, educational aspects, monitoring and review, and proposes a budget.

The report also surveys opportunities and needs in materials research, materials chemistry, materials physics, and living materials. The section on scanning tip microscopies and manipulation touches on experimental approaches using scanning tunneling microscopy and spectroscopy; atomic force, ballistic electron, and field-ion microscopies; and atomic manipulation and surface modification. The section on electron microscopies focuses on the 1 Å barrier and describes technical approaches and worldwide developments.

The report includes state-of-the-art illustrations and examples highlighting electronics, dislocation core structure, diamond surfaces, catalysis, and silicon "bugs."

The Administration's proposed FY 1995 budget, however, does not identify the AIM program or include these types of instruments as a line item. When asked, John H. Hopps, director of NSF's Materials Research Division, said that including the AIM program this year was not feasible because of other demands on NSF funds (LIGO and the Magnet Lab, for example). He did not rule out the possibility of including such a program in a future budget request.

To obtain a copy of the NSF Panel Report on Atomic Resolution Microscopy, please circle Reader Service Card No. 93.

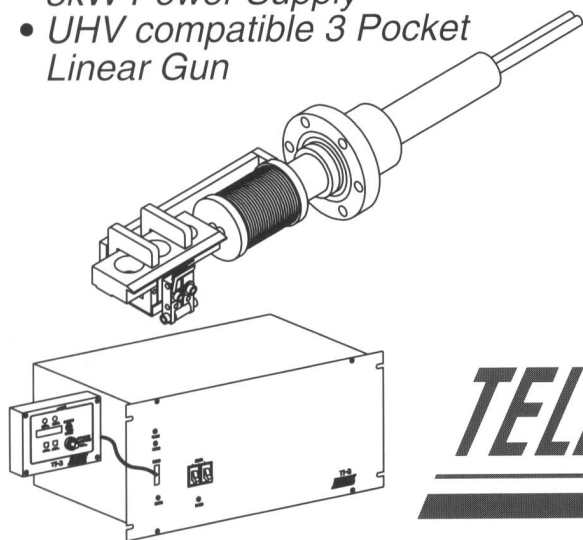
Carnegie Report Urges Congress to Restructure Its Handling of Science and Technology

Change seems to be the keyword for anything touching U.S. science and technology these days, be it setting policy or funding, and a recently released report by the Carnegie Commission on Science,

PVD COMPONENTS FOR THE LIMITED RESEARCH BUDGET

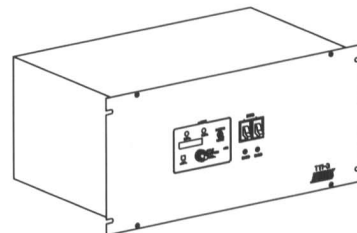
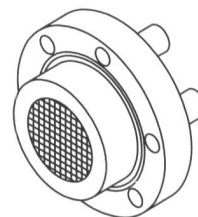
Multi-pocket Electron Beam Gun and Power Supply for less than **\$10,000**

- 3kW Power Supply
- UHV compatible 3 Pocket Linear Gun



DC Sputter Power Supply and Cathode for less than **\$5000**

- 2kW DC Power Supply
- 2" Sputter Cathode



TELEMARK

51 Whitney Place • Fremont, CA 94539 • TEL 510.770.8700 • FAX 510.770.8879

Circle No. 8 on Reader Service Card.

Technology, and Government follows this trend.

According to the Commission's report, overlapping congressional committee responsibilities and barriers to multiyear funding are limiting the ability of science and technology to solve the nation's problems. Asserting that "the time is right for reform," the Commission proposes procedural and organizational changes it deems will make congressional action on science and technology policy more effective.

Responsibility for science and technology in Congress is divided among 18 committees and dozens of subcommittees, making it impossible, says the report, to consider the nation's scientific and technological endeavor as a whole. Policymaking therefore suffers. This fragmentation also makes it difficult for the executive branch and the scientific and technical community to form productive partnerships with Congress, says the report.

To address these and other shortcom-

ings, the Carnegie Commission recommends that Congress:

- Establish a National Forum on Science and Technology Goals that can put these goals in the context of national and international objectives;
- Reform the committee structure to permit more consistent implementation and oversight of S&T programs;
- Modify appropriations committee jurisdiction to reduce the number of subcommittees responsible for funding S&T activities;
- Enforce existing rules on the division of committee responsibility, especially concerning authorization and appropriations committees;
- Extend funding cycles for S&T programs through multiyear funding mechanisms, such as multiyear appropriations, advanced or forward funding, and up-front funding of major construction projects;
- Test the effectiveness of a two-year congressional budget cycle; and
- Adopt, with the executive branch, an

accurate and consistent set of funding categories that would carry through the budget process.

The report also considers the controversial issue of academic earmarking as an "illuminating case study of S&T policymaking in particular and of congressional procedures in general." A 15-page chapter explains the nature of earmarking, charts earmark dollars from 1980 through 1992, offers pro and con arguments, and considers other aspects of earmarking. The Commission's conclusion: "To be an effective partner in science policymaking, Congress must find more appropriate instruments than earmarking." The Commission notes, however, that academic earmarking will be difficult to stop, and that solutions will require a combination of approaches and behavior changes by both Congress and universities.

To obtain a copy of the 93-page report, *Science, Technology and Congress: Organization and Procedural Reforms*, please circle Reader Service Card No. 95. □

Properties of Lattice-Matched and Strained Indium Gallium Arsenide

\$225.00

Edited by Professor Pallab Bhattacharya

InGaAs, grown on both GaAs and InP, is playing a pivotal role in the study of quantum systems which promise applications in microelectronic and optoelectronic devices. To realize commercially promising devices it is necessary to understand and fully characterize InGaAs systems. The above book will concentrate the output of the world expertise on this semiconductor into one internationally authored, highly structured, fully indexed volume with reviews, evaluations, tables, graphs and expert guidance to the literature in the following areas:

- Structural Properties
- Radiative & non-radiative recombination
- Optical Properties
- Thermal, mechanical & vibrational properties
- Bandstructure (lattice-matched & strained)
- InGaAs Technology
- Electro-Optical Properties
- Transport Properties
- InGaAs Devices (FETs, QWLs, photodiodes)
- Surfaces and contacts

EMIS Datareview Series Number 8 317pp., 280 x 210mm, hard cover ISBN: 0 85296 865 5 - 1993

TO BE PUBLISHED SOON

Properties and Growth of Diamond

\$245.00

Edited by Professor Gordon Davies

Diamond research is driven by the growing promise of applications in machine tools, mechanical engineering, optical coating, x-ray windows and light emitting optoelectronic devices. To fulfill this promise it is necessary to understand and fully characterize the diamond system as well as grow it controllably. This book, to be published soon, will draw together the world expertise on diamond and present it in one internationally authored, highly structured, fully indexed volume.

EMIS Datareview Series Number 9

Previous books in the EMIS Datareview Series are also available, covering properties of Aluminium Gallium Arsenide, Indium Phosphide, Gallium Arsenide, Lithium Niobate, Amorphous Silicon, Silicon and Mercury Cadmium Telluride.



IEE / INSPEC
IEEE Service Center

445 Hoes Lane, Piscataway, NJ 08855-1331
Phone: (908)562-5553 Fax: (908)562-8737

inspec

ALL MAJOR CREDIT CARDS ACCEPTED

Circle No. 12 on Reader Service Card.