

also scheduled for completion in FY 1983, and both are funded as part of the \$38.2 million requested in FY 1984 for gas-laser experiments. The program calls for a decision in FY 1985 about feasibility of using the CO₂ laser as an ICF driver. The Novette glass laser is two beams of the 10-beam Nova laser at Livermore. Construction funds for Nova were eliminated in the FY 1983 request; Congress appropriated \$34.5 million in FY 1983. Novette began experiments at the second harmonic (green) wavelength in early FY 1983 and will be used for weapons-physics experiments, including materials-properties studies, with an as yet undecided part of the \$70.4 million in FY 1984 funds requested for glass-laser experiments.

To use pulse-power technology for fusion, ion sources must be developed from which beams of light ions can be extracted and concentrated on small targets at high-power densities. This is the specific goal of the PBFA-II at Sandia, now in the design stage and scheduled to operate in FY 1986. The \$18.5 million set aside for pulse power research in the FY 1984 request will principally support experiments on PBFA-I at Sandia, but it includes funds for research at the Naval Research Lab and Cornell University. —JC

New study rates graduate physics departments

A new assessment of graduate departments in US universities has been published. The first such study in twelve years, it used objective criteria, such as library size and proportion of graduates who obtain jobs at PhD-granting universities, as well as reputational scores based on answers to a questionnaire.

The study finds that the ratings of top-level departments have changed little in the last twelve years. The physics departments whose faculties have the reputation for scholarly competence and achievement (with ratings on a scale of 0 to 5) are: University of California at Berkeley (4.9), Caltech (4.9), Harvard (4.9), Princeton (4.9), MIT (4.8) and Cornell (4.6). For effectiveness in educating their students to be research scientists, the top-ranked departments (with ratings on a scale from 0 to 3) are: Cornell (2.8), Harvard (2.8), Princeton (2.8), UC Berkeley (2.7), Caltech (2.7), MIT (2.7) and Stanford (2.7). The physics departments that have made the greatest improvements in their graduate programs between 1975 and 1980 (ratings on a scale from 0 to 2) are: University of Texas at Austin (1.9), University of California at Santa Barbara (1.7), University of New Mexico at Albuquerque (1.7), University of

Texas at Houston (1.6), North Carolina State (1.6) and Virginia Polytechnic (1.6).

The reputations of graduate departments were compiled from 211 returns of questionnaires sent to faculty at all the evaluated departments. The sample included larger numbers of respondents in the larger departments.

The organizers of the present assessment have attempted to correct what were criticized as shortcomings in two earlier studies: that results were out of date, that they permitted a university's overall reputation to influence an individual department's reputation, and that, by exaggerating the effects of size and wealth, they tended to make the rich richer and to reinforce the *status quo*. The new assessment presents the results by alphabetical order of school rather than by rank, as earlier studies did. The new study also includes more small departments. In physics, for example, it evaluates 126 departments, against 86 in the 1966 assessment and 113 in the 1970 study. The organizers attempted to query a greater number of academic scientists for the reputational questions than the earlier studies did. Unfortunately a low rate of response militated against that goal. (The rate of return of questionnaires regarding reputation was 57%, lower for physics than for any of the other five departments assessed in math and the physical sciences.)

Most important, the new assessment adds a number of objective measures of departmental quality to the ratings of reputation to which the earlier studies restricted themselves. The objective criteria are:

- Program size: number of faculty members in the program; number of program graduates; number of full-time and part-time graduate students enrolled who intended to earn doctorates.

- Characteristics of graduates: fraction of graduates who have received national fellowships; median number of years for receipt of PhD; fraction of graduates who had made definite commitments for post-graduate employment by the time they received their degrees; fraction of graduates who had arranged jobs at PhD-granting universities by the time they received their degrees.

- Size of university library.

- Publication records; number of published articles; estimated overall influence of published articles.

- Research support: fraction of faculty holding national research grants; total expenditures for R&D. For example, the departments that spent the most to support physics research are MIT (\$31 million), Cornell (\$15 million), Stanford (\$14 million), UC San Diego (\$11 million) and UT Austin (\$9

million). (This measure tends to favor programs with experimental emphasis over those oriented toward theory.)

An Assessment of Research—Doctorate Programs in the United States was sponsored by the Conference Board of Associate Research Councils, an umbrella agency, and was financed by private foundations and public agencies. The editors are Lyle V. Jones, Gardner Lindzey and Porter E. Coggeshall. It is several times longer than two earlier assessments, prepared for the American Council on Education, one of the participating agencies in the new survey: the first by Allen M. Cartter in 1966 and the second by Kenneth D. Roose and Charles J. Andersen in 1970.

The volume on mathematical and physical sciences is available for \$10.50 from its publisher, the National Academy Press. —DG

Pimentel heads Academy survey of chemistry

The National Academy of Sciences has initiated a new survey of chemistry, under the direction of George C. Pimentel (University of California, Berkeley). It has been 18 years since Frank H. Westheimer conducted a similar survey for the Academy. The goal is to produce a preliminary report by next October in time to influence budget decisions for the following year. A study of astronomy recently completed under George Field of Harvard (PHYSICS TODAY, April 1982, page 46) has been effective in this way.

The total estimated cost of the chemistry survey is \$500 000. It was started with \$17 000 from the National Academy and \$20 000 from the American Chemical Society. The Academy now seeks further support; they anticipate that NSF, the Department of Energy and the National Bureau of Standards will be among the contributors, and they have also received an additional \$80 000 from ACS. NAS would like to have the survey support divided about equally between Federal and non-Federal sources. The Westheimer report received approximately 75% of its funding from ACS.

The Academy has formed the committee that will do the bulk of this work for the survey and has assigned the members to five task forces (see table). The 26 members represent a variety of interests—academic, government and industrial—and a diversity of subfields. Each of the task forces will be asked to consider five questions as they relate to their assignments:

- What are the intellectual frontiers?
- What opportunities exist to meet societal needs both now and in the

Chemistry survey task forces and their assignments

Members and affiliation

Overall committee chairman

George C. Pimentel (Berkeley)

Task Force I

Allen J. Brad* (University of Texas, Austin)

William P. Slichter* (Bell Laboratories)

Fred Basolo (Northwestern)

Gerhart Friedlander (Brookhaven)

Harry B. Gray (Caltech)

Task Force II

John I. Brauman* (Stanford)

Alan Schriesheim* (Exxon Research University)

Hans G. Elias (Michigan Molecular Institute)

David A. Evans (Caltech)

Howard E. Simmons Jr (Du Pont)

George M. Whitesides (Harvard)

Task Force III

Ralph F. Hirschmann* (Merck, Sharp & Dohme)

Christopher T. Walsh* (MIT)

Josef Fried (Chicago)

Koji Nakanishi (Columbia)

Earl R. Stadtman (NIH)

Task Force IV

Vladimir Haensel* (Penn, retired)

Rudolph A. Marcus* (Caltech)

Harry G. Drickamer (University of Illinois, Urbana)

Isabella L. Karle (Naval Research Lab)

Fred W. McLafferty (Cornell)

Task Force V

John Birely* (Los Alamos)

Gabor A. Somorjai* (Berkeley)

Mostafa A. El-Sayed (UCLA)

William A. Lester Jr. (Berkeley)

Executive Secretary

William Spindel (National Research Council)

*Task Force cochairman

Key areas

high-temperature chemistry and combustion, chemistry and the environment, synthetic inorganic chemistry and inorganic minerals, nuclear chemistry, electrochemistry and corrosion, and analytic chemistry

supermolecular, synthesis, organic materials, polymers, physical organic and physical inorganic chemistry and organic energy sources

chemistry as it applies to the life sciences: biological macromolecules; receptor-ligand interactions; human health, animal health and agricultural chemistry

physical chemistry: catalysts and surfaces; molecular structure; reaction rates; condensed phases; intra- and inter-molecular energy transfer

instrumentation for chemistry: the laser revolution; computers in chemistry; molecular and ion beams; synchrotron radiation; surface-science techniques

ducted research in electronic materials processing and etching and deposition of thin films.

AIP publishes two new directories

New editions of two directories published by the American Institute of Physics are available.

The 1982-83 *Directory of Physics & Astronomy Staff Members*, which costs \$60.00 prepaid, lists over 30 000 scientists in 3000 North American institutions—colleges and universities, Federally funded R & D centers, government laboratories and industrial laboratories. Its 375 pages also contain appendices concerning educational programs.

The 1982-83 *Graduate Programs in Physics, Astronomy and Related Fields*, 920 pages, provides information about some 300 departments in the US and Canada. It costs \$15.00 prepaid (\$7.50 for students, for their personal use, also prepaid).

Both books may be ordered from Department M/N, AIP, 335 East 45th Street, New York, N.Y. 10017.

Petition advocates international SETI

Sixty-eight scientists have called for an international effort to detect radio signals coming from space in a search for extraterrestrial intelligence (SETI). Carl Sagan originated the petition; signers include Stephen Hawking, Fred Hoyle, Linus Pauling, Edward Purcell, Grote Reber, Roald Sagdeev and Kip Thorne.

The statement asserts that a search one million times more thorough than all previous ones can be conducted by using current radioastronomical technology, for only a few million dollars per year for the next one or two decades.

future?

► What techniques and facilities are employed?

► How does this field interact with other academic fields?

► What human and institutional resources are needed to achieve fully the potential?

Pimentel, a former deputy director of the National Science Foundation, is now with the chemistry department at Berkeley. He received his PhD in

chemistry from the University of California in 1949 and has been on the faculty at Berkeley since 1949, except for the period from 1977 to 1980 that he spent at NSF. His research interests include infrared spectroscopy and molecular structure, chemical lasers, hydrogen bonding, matrix isolation spectroscopy, infrared studies of planetary atmospheres, rapid-scan infrared and the thermodynamic properties of hydrocarbons. —JC

the physics community

Vacuum Science journal splits in two

The *Journal of Vacuum Science and Technology* has been divided into two journals. *JVST A*, subtitled Vacuum, Surfaces, and Films, deals with vacuum technology, vacuum metallurgy, surface science, thin films, and fusion technology. *JVST B*, subtitled Microelectronics, Processing and Phenomena, deals with vacuum processing, plasma processing, microlithography, the physics and chemistry of interfaces, and submicron devices.

Each journal will have four issues per year. Members of the American

Vacuum Society receive both journals. They are edited at the same office, whose new address is the Microelectronics Center of North Carolina, PO Box 12889, Research Triangle Park, N.C. 27709.

Gerald Lucovsky, who had been editor of *JVST*, is now editor-in-chief of both journals and editor of *JVST A*. He is a University Professor of Physics at North Carolina State University. Thomas M. Mayer, associate professor of chemistry at the University of North Carolina at Chapel Hill, is the new editor of *JVST B*. A graduate of Pennsylvania State University (PhD in physical chemistry, 1975), he has con-

in brief

Copies of *Women and Minorities in Science and Engineering* are available from Nancy Conlon, Division of Science Resource Studies, NSF, 2000 L Street N. W., Washington, DC 20550.

Polymer Science and Engineering: Challenges, Needs, and Opportunities is available from the National Academy Press, NAS, 2101 Constitution Avenue N. W., Washington, DC 20550. It was prepared by the *ad hoc* Panel on Science and Engineering of the National Research Council. □