

diffuse x rays and to correlate results with radio and visible emission. A scanning modulation collimator experiment, headed by Herbert Gursky (Smithsonian Astrophysical Observatory) and Hale Bradt (MIT), is expected to determine precisely the celestial position of selected cosmic x-ray sources and to investigate their size and structure. Lawrence Peterson (University of California at San Diego) and Walter Lewin are principal investigators on a hard x-ray and low-energy gamma-ray experiment.

Bromley report

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Since World War II, the US has set the style and pace for research in almost all areas of physical science, Bromley told us. If we decided, for some reason, to defer building a facility or concentrating on some topic, the subject remained virtually untouched until at some future time we decided to resume work. This is no longer true. Although we still have the strongest physics enterprise in the world, Bromley says, different countries, by being selective, have focused on various salients of the field and moved ahead strongly. This problem was not sufficiently emphasized before the report, he feels, and the identification of the problem has had a significant impact in Washington.

If we decide to drop back in one subfield, we are ignoring the tight interrelationship among the subfields of physics and throughout all of science. A technique developed in condensed-matter physics appears the next day in nuclear physics, then in the study of neutron stars, then in hadronic physics, Bromley remarks. And if an idea is developed elsewhere, if we are not working on the frontier, there are real problems in picking up the idea promptly. Furthermore, if we want to do applied physics, we must already be doing good basic physics. The only difference between the two, Bromley feels, is the motivation of the person who is doing the work.

The report urged that there be multiple support of science, pointing out that in countries where this approach had been dropped, the results had usually been unfortunate. Bromley is pleased that the Defense Department, NASA, Department of Transportation, and the Department of Housing and Urban Development are maintaining at least small programs in basic physics research. The report had argued that NSF should be responsible for maintaining a balanced physics program in the US; this is made difficult, Bromley notes, because NSF also attempts to maintain a balanced internal program.

Maintaining the national balance is especially important now that NSF is being urged to move into more applied research.

The response of the physics community to the report is difficult to assess. Conversations with industrial research managers suggest that the report has provided an effective overview of all of physics, a preview of the future in scientific manpower, and in many cases, specific ideas for using physicists, Bromley said.

By talking to people in a number of universities, Bromley learned that many of the physics departments have profited from the recommendations in deciding on expansions or contractions in different areas. Further, the report has helped to make it "socially acceptable not to cover the waterfront in physics," Bromley told us. During the 1960's physics departments that aspired to national stature felt that they had to have some activity in all the major subfields. But the report argued that it was not possible to spread resources that widely and still achieve excellence. Bromley does not claim, however, that the report was the only damper on such thinking. Some universities are using parts of the report as textbooks or auxiliary reading for physics majors in their junior and senior years.

Another impact of the report is that it appears to have stimulated similar studies in other sciences, for example geophysics and materials science. Bromley questions whether or not it will be worthwhile in the future to do quite as complete a study as the Physics Survey Committee did. He feels that future committees may concentrate on quicker, more specific reports. As yet there is no move towards a new physics survey.

Bromley is proud of the completeness of the scientific data base developed by his committee. He urges that the committee's recommendations on maintaining this data base be followed. When NSF discontinued support of the National Register, we lost the ability to get periodic snapshots and to do longitudinal studies—to learn about interfield migration and changing employment patterns, he says. One cannot correlate the surveys being conducted by the American Physical Society, the American Chemical Society, and the biological societies because of difference in definition, he notes.

The committee had been concerned that by the late 1970's the US would have a deficit in trained physicists because of declining undergraduate enrollments. This trend has now been reversed, at least in part, Bromley believes, because of the data base developed by the committee and because the report has demonstrated some of

the potential roles of physics in society. These things have helped lure students back, he says.

Another concern of the committee was that in the 1960's the number of institutions awarding PhD's in physics had roughly doubled while the number awarding bachelor's degrees had remained almost constant. As a result, the committee maintained, many of these new PhD institutions had marginal facilities and faculty. To satisfy the desire of the faculty in these places to remain active in research, the committee had advocated postdoctoral programs for these faculty that did not involve the training of graduate students. Such a program was recently inaugurated by NSF, Bromley remarked.

The committee was concerned about interdisciplinary programs for undergraduates, feeling that such programs were better left for graduate study. Initially the leaders of such programs have a firm ground in some discipline, Bromley explained. In an undergraduate program the student tends to get a little bit of all the disciplines, which leads to a dilettante attitude in the first generation. Then when that generation attempts to teach a second generation, you're in trouble, Bromley says. Many universities are now tending to emphasize disciplinary studies for undergraduates, and then bring them together in graduate school for interdisciplinary work.

The Bromley report also made some recommendations for the scientific societies, particularly for the American Physical Society. These were studied by the Committee on the future of APS, whose report has now been published. Bromley feels it is too soon to know what, in fact, APS will do about these recommendations.

"A report such as ours," Bromley concludes, "hopefully fulfills many different functions for many different audiences. Whether or not individual physicists may agree or disagree with any specific conclusions or recommendations, this sort of report is particularly useful in stimulating many members of the corresponding scientific community to back off from their more parochial problems and consider the opportunities, challenges and problems of their field as a whole." —GBL

Illinois experiments with technology-liaison plan

A Department of Commerce experiment, underway for a year, to transfer federally developed technology to private industry is being carried out by a group of engineers and physicists for the State of Illinois. They are staff members of the Division of Science and Technology, a section of the Illi-

nois Department of Business and Economic Development. Engineering specialties of the staff include mechanical, optical, electrical, electronics, industrial and production.

As technology transfer agents, they provide a link between research scientists and industrial businessmen. The liaison effort has borne fruit: More tax dollars are generated through increased business hiring and prosperity than is used to run the program itself, according to a spokesman for the division.

Help has come in the areas of new product development, technology implementation, production-flow development, cost accounting development, estimating procedures and production simplification.

Information can be obtained from Division of Science and Technology, State of Illinois, Suite 1122, 205 W. Wacker, Chicago, Ill. 60606.

in brief

A *Journal of Electrostatics* will be published quarterly, probably beginning in the fall of 1974. Manuscripts should be submitted to J. C. Gibbins, Faculty of Engineering Science, The University of Liverpool, Brownlow Hill, Liverpool L69 3BX, UK. For sample copies of the journal write to the Elsevier Scientific Publishing Co, PO Box 211, Amsterdam, The Netherlands.

A \$100 000 six-month-long project, funded by the Electric Power Research Institute and involving basic research on the synthesis of catalysts for coal liquefaction and gasification, has been negotiated between the Institute and the W. F. Libby Laboratories of Santa Monica, Calif.

The Atomic Energy Commission has

given grants in support of projects to study the generation of electricity by geothermal energy to Lawrence Berkeley Laboratory and the University of California, Berkeley, (\$800 000) and to Lawrence Livermore Laboratory (\$350 000).

Experiments for a series of physical-science laboratory manuals are solicited. The project is a joint endeavor of NSF, AEC and North Texas State University. For complete information, write to Jerome L. Duggan, Physics Dept., North Texas State University, Denton, Texas 76203.

A NASA-Stanford Joint Institute for Aeroacoustics has been established with fundamental research into the causes of noise pollution and the training of scientists in the field as primary objectives. Krishnamurty Karamcheti is the institute's director.

the physics community

Acoustical Society elects Gales and Cramer

Newly elected officers of the Acoustical Society of America are president-elect Robert S. Gales, of the Naval Undersea Research and Development Center in San Diego, California, and vice president-elect William S. Cramer, of the Naval Ship Research and Development Center in Washington, D.C.

Elected to the executive council were David M. Green (Harvard University); John C. Snowdon (Applied Research Laboratory, State College, Pennsylvania);

Lois L. Elliott (National Institutes of Health), and Chester M. McKinney (Applied Research Laboratories, University of Texas). Former president-elect Murray Strasberg, of the Naval Ship Research and Development Center in Washington, D.C., assumes the role of president, and Arthur H. Benade, of the physics department at Case Western Reserve University, formerly vice president-elect, becomes vice president.

Gales has studied hearing aids, audio masking, measurements and methods of detection of underwater sounds, and voice communication. He received his MA from the University of California at Los Angeles in 1942.

Cramer earned his PhD from Brown University in 1948. His interests include acoustic properties of plastics, and underwater and physical acoustics.

Two employment messages from AAS president Bok

Equal opportunities for women in astronomy, and employment of astronomers by colleges presently without astronomy programs were the subject of two circular letters recently distributed by American Astronomical Society president Bart J. Bok.

In his first letter, directed to astronomy department chairmen, observatory directors and other employers of astronomers, Bok outlined some conclusions of a recent study conducted by the AAS Working Group on the Status of Women in Astronomy. Among other facts, Bok noted that the percentage of women members in the AAS

has dropped from 17% in 1941 to 8% at present, and that the percentage of PhD's granted to women has declined from 14% in 1947 to 8%. He asked recipients of his letter to take specific steps to create equal employment and career opportunities for women.

Bok sent his second letter to deans of science in liberal-arts colleges and junior colleges, pointing out that approximately 300 000 undergraduates are taking astronomy courses each year. He asked colleges without astronomy programs to consider employment of the many highly qualified astronomers who are without work because of the recent decline in federal funding for astronomy. Explaining that the Society maintains a Register of Astronomers seeking employment as well as an Astronomer's Job Register listing current job openings in the field, Bok suggested that interested parties write to Henry M. Gurin, Executive Officer, American Astronomical Society, 211 FitzRandolph Road, Princeton, N.J.

Audrey Likely becomes AIP public-relations director

Audrey Likely has been appointed director of the public-relations division (formerly the public-information division) of the American Institute of Physics. During her 18 years with AIP she has held several public-relations positions: assistant to the director, assistant director, acting director, and, now, director of press relations. Recently she was named to the 1974-75 executive board of the National Association of Science Writers, Inc. □



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