state & society

US physics budget: NASA declines while DOD gains

The National Aeronautics and Space Administration is proceeding with development of the Space Shuttle, despite a budget plan for the 1977 fiscal year that lags behind inflation. However, the agency's one-year moratorium on spending for the Large Space Telescope has galvanized many astronomers into a widespread show of support for the project's rescue. Meanwhile, a continuing policy of real growth in basic-research funding at the Department of Defense bodes well for its physics programs in the coming year.

(The funding of research and development at NASA and DOD is examined in this article; ERDA's and NSF's R&D budgets were treated in PHYSICS TODAY, March 1976, page 85.)

Shuttle vs. scope? Notable boosts in FY 1977 R&D funding over the previous year's levels for the Space Shuttle (for example, for its main engine and for launch and landing operations) reflect determination at NASA to produce the shuttle as soon as possible. The FY 1977 budget request for the project (independent of payload experiments) is more than $1.28 billion, 35% of the agency's total budget plan ($3.69 billion, up just 4% from the previous year) and 46% of its R&D funding.

The LST, a 2.4-meter optical telescope to be placed aloft by the Space Shuttle in the early 1980's, was budgeted for a $12-million so-called "new start" in FY 1977, but NASA's final request includes no funding for the project. Princeton University's Lyman Spitzer (chairman, Astrophysical Sciences) and John N. Bahcall (Institute for Advanced Study) informed their colleagues of this event and urged them to express their opinions to NASA and to their congressional representatives. The astronomers sought at least $2.5 million in restored LST funds for the development of photon-counting detectors. According to Bahcall, "several congressional representatives and their staffs have been very helpful and evidenced a real understanding of the purposes of basic science." A House appropriations committee headed by Congressman Donald Fuqua (D., Fla.) has since voted to restore $3 million to the LST in FY 1977.

On completion the LST, which could observe at wavelengths from 10^{-7} to 10^{-3} meters with at least a tenfold improvement in resolution over ground-based optical telescopes, would cost $350–400 million. Its adherents are concerned that the FY 1977 funding drop might lead to termination of research efforts by disaffected industrial contractors.

Other NASA projects. The LST cut leaves the Solar Maximum Mission as the only FY 1977 new start in NASA's budget request for physics and astronomy (see Table 1). The mission craft will observe solar ultraviolet and x-ray emissions; it is designed for Delta-launch and Space-Shuttle retrieval. Space science, funded under the R&D section of NASA's budget, has fallen 13% overall, from $434 million in FY 1976 to $379 million in FY 1977.

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Lunar and planetary exploration also suffers in FY 1977; funding in these areas has plummeted from $254 million in FY 1976 to $191 million. Among the casualties is a proposed Mariner Jupiter–Uranus mission. But the second

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NAS Assembly establishes procedures and priorities

The reorganization of the National Academy of Sciences–National Research Council shows signs of bearing fruit. Both the Assembly of Mathematical and Physical Sciences and its Office of Physical Sciences Advisory Board are making progress in establishing organization procedures and research priorities.

We discussed Assembly developments with D. Allan Bromley, AMPS Executive Committee member and chairman of the OPS and its Advisory Board. He told us that a primary benefit from the reorganization is that requests to the NRC, formerly channeled to a particular division of relatively narrow interests, now are presented directly to the Assembly, whose members share a much broader and more varied scientific expertise; this is in response to the increasingly interdisciplinary nature of the tasks to which the NRC directs its attention.

While it is too early for solid evidence, Bromley feels that the new system is working. He cites the repeated occurrence, when panel proposals have been brought before the AMPS Executive Committee, of promising new areas of study or new aspects of a problem being pointed out that possibly would have been missed altogether in the earlier, less variegated context. Also, he believes heightened sensitivity has led to more balanced panels, with the broader expertise on the Executive Committee promoting more immediate identification of the right participants.

The Assembly of Mathematical and Physical Sciences is one of four assemblies and four commissions (the others are the Assemblies of Behavioral and Social Sciences, Engineering, and Life Sciences, and the Commissions on Human Resources, International Relations, Natural Resources, and Sociotechnical Systems) created in the reorganization of the National Research Council (see PHYSICS TODAY, May 1975, page 69). Much of the review and

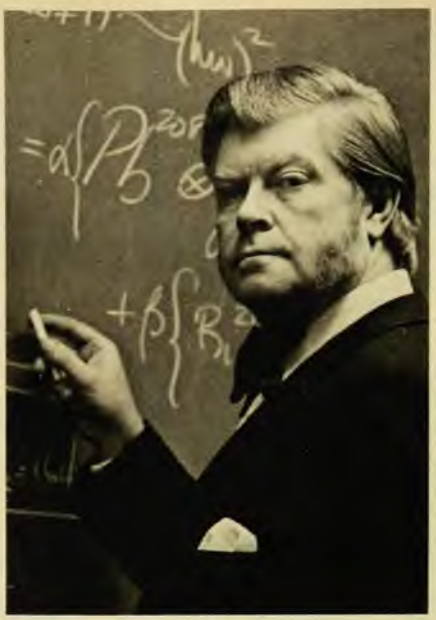
approval function formerly centralized in the NRC Governing Board has been delegated to the executive committees of the assemblies and commissions.

The assembly's executive committee, headed by Norris E. Bradbury (former director of Los Alamos Scientific Laboratory), governs the Assembly and itself reports to the NRC Governing Board. Jacob Bigeleisen, professor at the University of Rochester, will become chairman of the Assembly in May. Four discipline-oriented offices within the Assembly, each with its own advisory board, study specific problems and make recommendations to the Assembly.

Assembly activities range from the answering of highly specific questions to plotting out the future of a whole science. In each case, an Executive Committee member, acting as steward for one or more boards or committees, functions as a liaison between the Executive Committee and staff dealing with the problem. One of the activities actually completed by the assembly at this date is the Solar Energy Research Institute study.

Office advisory boards operate as extensions of the Executive Committee; the advisory boards bring about 40 additional people into the activity-consideration process. Board members ask what new activities NRC should undertake, what areas may be falling through the cracks, and what programs may have outlived their usefulness. The boards' recommendations concerning such questions then go to the Executive Committee of the Assembly for consideration.

Regular members of the OPS Advisory Board are Bromley (Yale), who headed the NAS Physics Survey Committee, which released its initial report in 1972; Albert M. Clogston, Bell Laboratories; Herbert Friedman, US Naval Research Laboratory; Ronald Geballe, University of Washington; Riccardo Giacconi, Smithsonian Observatory's Center for Astrophysics; Richard F. Post, Lawrence Livermore Laboratory; Arthur L. Schawlow, Stanford University and Frederick Seitz, Rockefeller University. There are also six *ex officio* members, five from the AMPS Executive Committee and H. William Koch, director of the American Institute of Physics.



BROMLEY

Bromley reports that his Board's recent activities include a broad overview of all existing NRC activities inherited from the previous system. Specifically, the Board has been considering what expansions, contractions or other changes appear necessary. His Advisory Board is urging that parallel standing committees be established in numerous areas, while at the same time they recommend a number of ad-hoc panel studies.

Assembly accomplishments in 1975 of interest to physicists include studies of the biological and climatic effects of aircraft emissions in the stratosphere by the Climatic Impact Committee and of long-term worldwide effects of multiple nuclear weapons detonations by an ad-hoc NAS committee that published its controversial report in September, 1975. The Committee on Nuclear Science completed a three-year program of bringing data compilations up to date, and a report on funding, facilities and manpower in nuclear science was published in June, 1975. Establishment of the Committee on Geodesy was authorized in March 1975, by the AMPS Executive Committee, to review the field's status. —FCB

Nuclear-power committee

Harvey Brooks, Pierce Professor of Technology and Public Policy at Harvard University, and Edward Ginzton, chairman of the board of Varian Associates in Palo Alto, California, have been appointed co-chairmen of a National Research Council committee that will analyze and evaluate the role of nuclear power in the context of alternative energy systems in the US. The study was requested by ERDA and will be carried out within the NRC Assembly of Engineering.

The study will compare various nuclear power options, particularly the breeder reactor, with other energy systems in terms of a 35-year time span. An initial report will be made to ERDA in December, 1976.

ERDA's nuclear centers suffer

Substantial cuts are expected at ERDA-sponsored nuclear-research centers in the wake of a $2-million dive in the agency's nuclear-science budget. Funding dropped to zero for the 1977 fiscal year, as we mentioned in last month's budget report, for nuclear-science programs at the University of Maryland's cyclotron laboratory and at Iowa State University's Ames Laboratory.

Nuclear-science studies at Ames Laboratory, supported at close to a $650-thousand level by ERDA for FY 1976, are based on the research reactor there. The experimental program utilizes the TRISTAN on-line mass separator for investigations of short-lived fission-product nuclei, and the facility's capabilities include on-line measurement of assorted decay-process phenomena. Theoretical research activities are concentrated on nuclear structure, with emphasis on col-

Washington Bulletins

★ **New copyright legislation** is now up to the House. In mid-February the Senate passed—by an uncontested 97–0 vote—a bill that would substantially alter the US copyright law, in effect since 1909. It is now the task of the House judiciary committee's Subcommittee on the Courts, Civil Liberties and the Administration of Justice, headed by Robert W. Kastenmeier (D., Wisc.), to devise a counterpart measure. The subcommittee, its hearings on the subject already completed, was expected to begin marking up a House bill by the first of this month if not before; the process could continue into May. Kastenmeier predicts House action on a new copyright bill by summer.

★ **The White House science adviser** may soon become a reality, provided no new stumbling blocks crop up to delay Congressional action. House and Senate conferees have been appointed to iron out differences beween the two chambers' sharply varying bills to create an advisory office on science and technology policy within the White House. President Ford recently urged Congress to pass the legislation promptly, indicating that the House version and ("with some changes") the Senate version are both acceptable.