

state & society

Budget: some programs to be boosted, others cut

Funding for physics in the FY 1974 budget is at about the same level it was in the budget for FY 1973. Many programs will get small increases, which will help to make up for the effects of inflation, but some, such as the National Accelerator Laboratory and the controlled thermonuclear research program will get substantial increases. Others, like the rest of the Atomic Energy Commission's national laboratories, will be cut. One NSF official estimated that total funds for physics research in the universities and colleges would total around \$140 million, or about the same dollar level as last year.

Applied research is still the direction in which a lot of the money is flowing. NSF director H. Guyford Stever said that the new budget would continue to provide support for research and education, but that "the highest priority, however, is accorded the research programs which promote fundamental research in the long-range national interest and pursue research related to understanding and solving domestic problems." In keeping with this, the NSF Scientific Research Project Support program, which funds basic research, is requesting a rise of 5% to \$275 million as compared to an 11% rise to \$79.2 million in Research Applied to National Needs. In the Scientific Research Project Support program, the hard sciences and life sciences are requesting increases ranging from \$0.2 million on the \$12.4 million request for atmospheric sciences to \$1.5 million on the \$36.5 million request for physics and \$1.5 million on the \$58.8 million request for biological sciences. Social sciences will get an increase of \$2.1 million if a request for \$25.4 million is approved, and engineering will go up \$2.6 million on passage of a request for \$29.5 million.

The NSF request for FY 1974 totals \$641 million, an increase of \$26.5 million over the estimated spending for FY 1973. These figures, however hide the fact that the apparent largesse of the proposed increase is due to \$62.4 million in appropriated funds that were withheld by the Office of Management and Budget in FY 1973 and

added to the FY 1974 NSF figure. As a result of the expected release of these funds, the appropriation request for 1974 is only \$579.6 million plus \$3 million in foreign currency as opposed to the 1973 appropriation of \$638 million plus \$7 million in foreign currency.

The NSF physics budget within the Scientific Research Project Support has requested \$36.5 million, an increase of \$1.5 million (about 4%) that will amount to little or no real dollar gains if the current rate of inflation of about 4% or 5% per year continues. Marcel Bardon, the head of the physics section at NSF, said that the FY 1974 physics budget would essentially hold the line, although there are "some limited new thrusts in various fields of physics that will be funded at the expense of existing programs."

The NSF elementary-particle physics program is heavily involved in the support of users groups at the national laboratories (particularly NAL) and Cornell. The nuclear-physics funds will be under pressures from the users

of Nevis, LAMPF, and those at Indiana and from various developmental studies for new light- and heavy-ion accelerators. In theoretical physics, support will continue for work on elementary particles, nuclear structure and reactions, and there will also be some emphasis given to theoretical studies of gravitational interaction, including probes of source mechanisms, new experimental tests of gravitational theories and work on the problems of quantizing gravitational fields. NSF will continue to support a broad array of experimental studies in atomic, molecular and plasma physics, with some emphasis on new possibilities such as higher resolution spectroscopy and atomic interactions in an extended range of energies. Solid-state and low-temperature physics funding will respond to increased pressures in surface science, including studies of chemisorption, high-resolution studies of surface structure and studies of the behavior of monolayers adsorbed on regular surfaces.

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Ray appointed chairman of AEC

On 6 February President Nixon announced the appointment of Dixy Lee Ray as chairman of the US Atomic Energy Commission. Ray is the first woman chairman of the AEC, and, upon her appointment to the Commission last August, she was the first woman ever named to a full five-year term. She succeeds James R. Schlesinger, who has become Director of Central Intelligence.

A marine biologist specializing in marine invertebrates, Ray was director of the Pacific Science Center in Seattle and an associate professor of zoology at the University of Washington prior to her AEC appointment. As director of the PSC, a position she held since 1963, Ray was actively involved in improving the public understanding of science. The Center develops participation programs, demonstrations and exhibits in various fields of science.

Ray holds a BA (1937) and MA (1938) in zoology from Mills College in



RAY

J. E. WESTCOTT, USAEC

Oakland, California. After completing a PhD in biology at Stanford University in 1945, she joined the department of zoology at the University of Washington, where she has been engaged in research and teaching ever since. Among other science responsibilities, she has served on the executive committee of the Friday Harbor Laboratories (1945-60); she was a special consultant in biological oceanography to the National Science Foundation (1960-62); she was chief scientist and visiting professor on the Stanford University research ship *Te Vega* during the International Indian Ocean Expedition in 1964, and she served on the Presidential Task Force on Oceanography in 1969.

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According to Bardon, dropouts from other agencies who come to the physics section for support are "a problem very much smaller than they were a year ago, when they made a big impact." There is no new funding included in the 1974 budget earmarked to absorb dropouts, he said, and those who have lost funding at other agencies are simply put into open competition with others.

The NSF budget includes continuing decreases in funding for its institutional grants for science, down to \$6 million from \$8 million, and the termination of the graduate traineeship program, funded at a level of \$9.2 million, down \$4.8 million from FY 1973. This represents the end of this program and provides funds for the continuation of some awards and 500 new ones.

At the Foundation's National Research Centers, funding at Arecibo has dropped by \$0.2 million to \$3.1 million,

Cerro Tololo remains constant at \$2.6 million, Kitt Peak is up \$0.4 million to \$8.0 million and the National Center for Atmospheric Research is up \$1.0 million to \$17.1 million. Funding for the National Radio Astronomy Observatory is up \$7.3 million to \$17.2 million, but this includes \$10 million for the Very Large Array as planned when the project was announced last year.

Although increased opportunities are available to astronomers with the expected opening of the new 4-meter telescope at Kitt Peak and the twin instrument at Cerro Tololo and the upgrading of the Arecibo antenna, the small increase in the NSF astronomy program is overshadowed by the recent cuts in the NASA research program. NSF officials expect that many of those whose research is no longer supported at NASA, particularly those involved with HEAO, will come to NSF for grants, but that no money will be available. NSF is receiving an increase of \$0.4 million to \$9.0 million, which may be compared with the \$179 million cut from the NASA FY 1973 appropriated funds.

NSF will be supporting work on x-ray stars and some gamma-ray work as well as research on and installation of improved optical and radio detectors (particularly in the millimeter-wave region) for existing telescopes. The radio-telescope installations at Ohio State University and the University of Illinois will lose NSF support in 1974.

AEC. John Teem, head of the physical research program at AEC, said that the program had done well in this quest for funds in the FY 1974 budget. He said "although it is always the case that people feel that they should have gotten more money, we've done very well in a very tight year."

Within physical research, high-energy physics received an increase of \$4.1

End of Astron

At Lawrence Livermore Laboratory the Astron Program has been terminated effective 28 February. After the death of Nicholas C. Christofilos last September the \$1.9 million/year program had been headed by Richard Briggs. The fate of a classified program funded by ARPA that used the Astron facility is still being reviewed. The superconducting Levitron experiments are being phased out by the end of the fiscal year; this program, headed by Charles Hartman, cost \$400 000/year. The staff associated with both programs are being transferred to a scaled-up mirror program.

million, but the National Accelerator Laboratory, which is expected to be in full operation by the end of this year, got an increase of \$9.2 million. The Cambridge Electron Accelerator will terminate research some time in 1974 if the NSF does not pick it up as a synchrotron radiation source, and there are reductions in the high-energy programs at all of the other labs. Los Alamos, which is part of the medium-energy program, received an increase of \$2.7 million for work at LAMPF.

There is a shift in emphasis in the AEC nuclear chemistry and low-energy physics programs to more work with heavy ions. In the metallurgy and materials section of the physics program there will be a continued emphasis on studies of the effects of radiation on materials and the use of neutron scattering to study the structure of solids.

Layoffs have been announced at many of the AEC's laboratories. Although there were no breakdowns on what job categories will be affected at press time, the total numbers are: Argonne, 250; Brookhaven, 225; Lawrence Berkeley, 210; Lawrence Livermore, 275; Los Alamos, 200; Oak

Table 1. NSF Scientific Research Project Support

Discipline	(Millions of dollars)	
	FY 1973 (estimated)	FY 1974 (requested)
Atmospheric sciences	12.2	12.4
Earth sciences	10.3	11.3
Oceanography	13.1	14.5
Biological sciences	57.0	58.8
Physics	35.0	36.5
Chemistry	25.3	26.7
Astronomy	8.6	9.0
Mathematics	14.0	14.4
Social sciences	23.3	25.4
Engineering	26.9	29.5
Materials Research	35.0	36.5
Total	261.0	275.0

Table 2. NSF Physics Budget

Program	(millions of dollars)	
	FY 1973 (estimated)	FY 1974 (requested)
Atomic, molecular and plasma physics	3.6	3.7
Elementary particle physics	14.9	15.5
National Magnet Laboratory*	2.5	2.7
Nuclear physics	11.7	12.2
Solid-state and low temperature physics*	9.8	10.1
Theoretical physics (except low temperature and solid state)	4.8	5.1
Total	47.3	49.3

*Handled in Division of Materials Research