

Defense R&D grows to become 67% of all Federal R&D

While funds for all Federal R&D are increased \$6.9 billion in President Reagan's FY 1984 budget request, 97% of this growth represents an increase in support for R&D in the Department of Defense. Since 1980 there has been a dramatic shift of Federal funds into defense-based research. In FY 1980 the Federal investment in R&D was split approximately evenly—48% for defense and 52% for all other R&D. The FY 1984 request of \$31.8 billion for defense R&D, including weapons research conducted by the Department of Energy, is up 110% over FY 1980 appropriations, while support for all other R&D programs is 15% lower than FY 1980 levels. Physics research and basic research in general are not scheduled to reap large harvests from this increased budget.

Funding for basic physics research (approximately \$76 million for all three armed services), which represents a very small fraction of the total DOD research budget of \$29.9 billion, is now slated to increase an average of 10% in FY 1984. A five-year initiative to improve research instrumentation at universities, begun in FY 1983 with \$30 million, will continue as planned in FY 1984 with \$30 million, despite the unexpectedly large number of requests for these funds (see box for details). In addition, the Defense Advanced Research Projects Agency budget, up 18% over FY 1983 appropriations in the request, includes more support for some physics-research programs.

Even these increases, however, are

tentative pending Congressional action, according to Leo Young, director of research and technical information for DOD. Young told us that if the basic-research budget could retain the approximately 4½% of real growth in the submitted budget (considering inflation as 5%) most programs would be in good shape. "In the past," he said, "the requested amount has usually been higher than what was appropriated. The biggest danger is that Congress often makes undistributed cuts which have a larger impact on research projects than on weapons programs." In fact, sources in the Defense Department said, "For a number of years basic research has been a victim of the budget process because the Appropriations Committees in Congress favor hardware and systems acquisitions over research. When Congress reduces the President's request, DOD has less to spend on basic research because Congress protects certain programs from any reductions. In the competition for DOD research funds, higher priority and greater emphasis are given to more applied and short-term militarily relevant research, resulting in further diminution of support for long-term basic research. This paradoxical situation—of reduced funds available for long-term basic research while funds for research overall are increasing—has only been heightened in the last few years with the larger Reagan DOD budget requests."

The DARPA budget request for FY 1984 of \$867 million is up 18% over FY

1983 appropriations of \$729 million. According to Carl Romney, deputy director of DARPA, \$108 million of the total requested in FY 1984 is for basic research, up \$8 million from FY 1983 appropriations. A new initiative in supercomputing, with the objective of developing ultra-high-speed computational systems for military use, is now slated to receive an additional \$50 million in the FY 1984 request. Initially this research will focus on artificial intelligence and on gallium-arsenide technology, including research both on the materials and electronics of VLSI circuits. Some basic research programs are largely done at universities. Romney told us in FY 1984 support for these programs would include \$18 million for research in microelectronics and solid-state physics, \$14 million for research in materials science, and \$38 million for research in computer science, primarily in artificial intelligence and advanced digital structures. In addition, the request supports basic research mainly done by industry or at defense labs. This includes \$33 million for R&D on particle-beam technology, \$20 million for high-energy, short-wavelength laser research, \$7.5 million for research on large optics for laser-beam control, and \$5 million for R&D on space nuclear power.

The FY 1984 budget request for physics research in the Office of Naval Research is \$36.9 million, up \$6.5 million from \$33.4 million appropriated in FY 1983. Included in this funding are a number of what the Navy terms "special-focus programs," which are specifically targeted five-year research programs. New among these programs in FY 1984 is a research initiative on ultra-low-loss glass fibers; \$1.08 million is requested to support research on the purification and drawing of high-transparency materials suitable for use in optical fibers for secure long-distance data links. Another new initiative on electro-optical countermeasures is funded with \$600 000 in the FY 1984 request. Priority is also given to some special programs already under way. In FY 1984 \$1.5 million is requested to support continuing research on the Kilojoule Advanced Research Laser; this program involves the design and construction of a high-energy gas laser to be used for experiments in strategic laser communication and directed-energy weaponry. Support for two

DOD swamped with requests for instrumentation funds

DOD began a program to improve instrumentation for defense-related research at universities with \$30 million in FY 1983 funds. This initiative is to continue for five years with \$30 million budgeted in each fiscal year, \$10 million for each of the armed services. DOD administrators of the program were surprised, however, by the response elicited by the offer of much-needed funds for instrumentation. The Office of Naval Research, which coordinates the program for DOD, confirmed that 2499 proposals were received; this represents approximately \$750 million in requests received for \$30 million of FY 1983 funds. Such a large response underlines the need to replace and upgrade obsolete university instrumentation indicated by stu-

dies conducted at NSF and the Association of American Universities, among others (PHYSICS TODAY, July 1982, page 55).

DOD had originally planned to emphasize support for larger instruments, in the \$100 000 to \$1 million price range. The proposals received ranged from \$50 000 to \$1 million, but, due to the large number of proposals, no million-dollar grants were given. DOD is preparing statistics about this program to help with plans for using FY 1984 funds. These figures should be available soon. Information about submitting proposals for FY 1984 funds will also be available in May from DOD-University Research Instrumentation Program, Air Force Office of Scientific Research, Bolling AFB, Washington, DC 20332.