

In March 1982, DOD set up the DOD-University Forum as a way of reconciling the military and academic viewpoints—or, as a Defense lawyer has put it ungraciously, “calming the restless natives.” The forum consists of eight university presidents, three association executives, and ten DOD representatives, with its cochairmen being Stanford University president Donald Kennedy and Defense’s DeLauer. Since then, the forum has met twice, most recently on 20 April, when it approved the report of a working group on export controls. The report calls for providing the scientific community with “clear and stable guidelines” for the international transfer of information, though it recognizes that a coherent technology transfer policy does not yet exist throughout the government. It recommends that DOD policy regarding academic science be based on the principles of the Corson Report, especially for the so-called “gray areas” of sensitive technologies, and that controls on DOD-funded research be specified in contracts. The contract, says the report, “is seen as a mechanism to convey information about the need to delay the transfer of technology. The whole structure stands on the foundation of presumed willingness on the part of the research performer to make an earnest effort to inhibit the flow of truly sensitive information. If that presumption is not true, then the foundation is gone.”

Moreover, some forum members are wary of rigid enforcement of EAR and ITAR on academics. “Attempting to impose tight controls over a broad spectrum of research activities would be divisive, inhibiting, and counterproductive,” said the working group paper the forum has endorsed.

Anticipating such criticism, the President’s national security adviser, William P. Clark, decided to organize an interagency study involving seven departments, the Central Intelligence Agency, NASA, General Services Administration, and NSF. Headed by Ronald B. Frankum, deputy director of the White House Office of Science and Technology Policy, a working party was named to clarify government policy on export controls of scientific research. The issues were phrased in questions listed in National Security Study Directive 14-82, signed by President Reagan last 23 December:

► How can the government improve the manner in which it determines what unclassified, nonproprietary scientific research information should be subject to control so as to focus its efforts efficiently and to avoid raising fears of intrusion within the scientific research community?

► What changes, if any, are required to ensure that implementation of export

control regulations does not interfere with the legitimate communication of scientific research information and to ensure that the burden of compliance on the scientific community is reasonable and acceptable?

► What should be the government’s policy with regard to information presented at open scientific meetings, and what procedures should be developed to ensure consistent implementation of that policy?

The interagency group first met in January in hope of meeting its report deadline of 1 March. After meeting up to three times a week, often for seven or eight hours at a stretch, and writing seven drafts, none of which won full agreement, the panel was disbanded in late February. On 25 February, Clark produced a classified study directive 5-83, signed by Reagan. The new study is widened considerably to include non-government scientific research as well as government sponsored work in universities, foundations, and national laboratories with military implications. It was unveiled publicly on 18 April by Louis T. Montulli, OSTP senior policy analyst for national security and space, at a special session of the American Physical Society meeting in Baltimore. As Montulli explained it, the study seeks to answer the questions: Is there too much militarily sensitive information being released by

the US in classified form, and, if so, where is the most cause for concern? Once the source of leakage is identified, what types and levels of controls would be needed to stop the leaks?

The senior steering group this time is headed by an official of the National Security Council. Under it are three working parties to review government organization structures concerned with technology transfer, to evaluate US policy on technology export controls in the light of foreign, economic and military objectives and to assess the problems and policies associated with unclassified, militarily sensitive scientific communications. This summer and fall, according to Montulli, the scientific community will be asked to appear before the working groups, answer lengthy questionnaires and review draft reports. By the end of the year the steering group is required to send the President a policy statement for action—presumably through an executive order or legislation.

“I’ll be surprised if university science that is not funded by government is part of our problem,” Montulli told APS. “But I consider the problem we face as extremely serious. If the solutions proposed are worse than the problem, I am assured this administration won’t impose them. We are going to try to produce a practical system.” —IG

Physics does well in NASA budget

The President’s budget request of \$7.106 billion for NASA in FY 1984 represents an increase of \$267 million or 3.75% over FY 1983 appropriations. Physics and astronomy programs fare rather well within this request, up \$73.6 million or 17% over FY 1983. Unlike last year, the FY 1984 request includes four new starts—a Shuttle-tethered satellite, a Numerical Aerodynamic Simulation capability project, an Advanced Communication Technology Satellite, and the Venus Radar Mapper. The planetary exploration budget, which was cut 25% last year, is up in the FY 1984 request from \$186.4 million appropriated in FY 1983 to \$205.4 million (or just a little less than the FY 1982 appropriation).

Funds for research and analysis programs, which support teams at universities, are down once again in the FY 1984 request; for example, funds for planetary R&A are cut from \$50.3 million appropriated in FY 1983 to \$45.5 million. Last year Congress restored funds for R&A programs. This year funds for R&A were increased in action in both Houses, but the final budget has yet to be decided. A more urgent question, however, is the final

budget for the Space Telescope.

Space Telescope. The President’s request includes \$120.6 million for the telescope, originally scheduled for a 1983 Shuttle launch and postponed to 1985. NASA spokesmen told us that management problems at Perkin-Elmer Corporation, the main contractor for the telescope, will cause significant cost overruns and yet another delay in the launch. An investigation, scheduled to be completed by June, is now in progress at NASA. New people, including some with space experience, have been shifted into management positions at Perkin-Elmer, said Frank McDonald, chief scientist at NASA. The present problems have already caused the launch of the telescope to be delayed until 1986, but NASA spokesmen said that not all the technical problems have been dealt with, and it would be reasonable to expect some further delay.

And where will the money come from to pay for these overruns? “While the telescope is the highest-priority mission in space science, it would be short-sighted to finance overruns on the Space Telescope from other scientific programs. This would set us on a

course of precipitous decline," said Thomas Donahue (University of Michigan and head of the Space Science Board). He estimated that a lower limit for the overruns would be in excess of \$250 million, out of a total estimated expense of \$700 million. Congress has not acted on the final NASA budget, but the indications are good. Both Houses have added funds specifically to cover cost overruns associated with the Space Telescope.

McDonald was also worried about the impact these delays will have on other programs. For example, the Advanced X-ray Astrophysics Facility was originally planned to be a new start in FY 1986, but is expected to be delayed as a result of problems with the telescope. McDonald explained that these projects were originally planned to be done in sequence and, he said, "It is not possible now to tell how much of a delay or the exact nature of the adjustment that might have to be made to this project." AXAF was the highest priority of the Astronomy Survey Committee of the National Academy of Sciences led by George Field of Harvard (PHYSICS TODAY, April 1982, page 46). Gerry Shannon, who coordinates the Space Science Working Group at the AAU, told us "If AXAF isn't ready to fly by 1990 there will be a real loss of continuity in data, putting stress on the research staff at many universities." The Solar Optical Telescope, now in the early stages of planning, might also be affected.

Space science. The FY 1984 budget request includes only a 3% increase for space science and applications; however, this reflects a growth of 14% in the science budget and an 18% decline in the applications budget. Within the \$514.6 million requested for physics and astronomy, funding for the Gamma Ray Observatory increases a whopping 160% over FY 1983 to \$89.8 million in FY 1984. This project suffered an estimated two-year delay as a result of FY 1982 cuts that brought the funding down to \$5 million. The design should be completed in 1984 and the launch is now scheduled for 1988.

Planetary exploration programs increase 10.2% to \$205.4 million in the FY 1984 request. Among them is the Venus Radar Mapper, a new start in FY 1984 with \$29 million; it is a scaled-down version of the Venus Orbiting Imaging Radar mission authorized by Congress in FY 1982, but eliminated in the FY 1983 request. Hans Mark (Deputy Administrator of NASA) told us the new plans call for only one antenna, which will be used both to collect data over the complete orbit and to transmit it back to earth. Mark estimates the cost of VMR as \$350 million over the next five years, or about half of the estimated cost of

VOIR. To achieve this saving, the atmospheric experiments originally planned for VOIR were dropped and some accuracy was lost, but VMR will still use synthetic aperture radar to penetrate the thick clouds that cover Venus and obtain a 1-km-resolution map of the surface of Venus. The work on developing VMR will be done at the Jet Propulsion Lab; it is now scheduled for launch on the Shuttle/Centaur upper stage in 1988.

The Galileo Mission continues with \$79.5 million in FY 1984, down 13.2% from 1983. The launch vehicle has changed back from the inertial upper stage to the Centaur, which has caused the scheduled launch to slip from 1985 to 1986. However, by using the more powerful Centaur launcher, Galileo is scheduled to arrive at Jupiter in late 1988 instead of in 1990. In addition to orbiting Jupiter and obtaining photographs of its major satellites, the mission will drop a probe into the atmosphere and *in situ* experiments will measure the characteristics of the atmosphere.

The FY 1984 request also provides for initiation of the design and development of the Extreme Ultraviolet Explorer; the EUVE experiment is under the direction of its principal investigator, Stuart Bowyer at Berkeley; work on the spacecraft is now being started at JPL. The International Solar Polar Mission, a joint venture with the European Space Agency, is slated to receive

\$8 million in FY 1984, up from \$6 million appropriated in FY 1983. This is a scaled-down version of the original plan to fly two spacecraft simultaneously over the Sun's poles. The single European spacecraft, carrying some American experiments, is now scheduled for launch in 1986.

While the budget for space transportation systems declines 3% to \$3.49 billion in the FY 1984 request, \$3.3 million is requested for a new Tethered Satellite system. This will be a joint effort by the US and Italy to drag a satellite up to 100 km beneath the Shuttle and conduct experiments in the upper atmosphere.

Data analysis. Funds for tracking and data acquisition increase in FY 1984 to \$700.2 million, including \$200 million to begin paying for a satellite that will replace many tracking stations. Last year's cuts to the tracking budget threatened to silence the Pioneer missions. The 10% cuts to the research and analysis budgets in the FY 1984 request, however, alarmed scientists. Like last year, Congress has increased support for R&A. While still concerned about support for R&A and the final NASA budget, Donahue shared an optimism expressed by others we spoke to in the scientific community—a feeling that within the Administration the climate had changed for research support. He said "I don't believe there will be a repeat of these crazy exercises next year."

—JC

Once again, bad grades for US schools

Challenged by the Soviet Union's sputniks and confronted by the postwar baby boom, a strong constituency developed in the late 1950s for improving US education, especially in science and mathematics. Local bond issues were voted to build more classrooms, equip more school laboratories and hire more teachers. Colleges and universities ran teacher-training programs. Leading scientists, worried about the poor preparation of students entering their classes, became active in curriculum reform, preparing new textbooks and other teaching materials in efforts supported by the National Science Foundation and Office of Education.

Over the years, however, the commitment to improving the nation's school system has dissipated. Current attitudes about education at every level, said the 18-member National Commission on Excellence in Education in its slim but forceful report, *A Nation at Risk*, released on 25 April, are characterized by "a tension between hope and frustration." With its strong language, the report is admirably uncompromising.

"We report to the American people that while we can take justifiable pride in what our schools and colleges have historically accomplished and contributed to the United States and the well-being of its people, the educational foundations of our society are presently being eroded by a rising tide of mediocrity that threatens our very future as a nation and a people. What was unimaginable a generation ago has begun to occur—others are matching and surpassing our educational attainments," the opening page declares.

"If an unfriendly foreign power had attempted to impose on America the mediocre educational performance that exists today, we might have viewed it as an act of war. As it stands, we have allowed this to happen to ourselves."

Since it was appointed in August 1981 by Terrel H. Bell, Secretary of Education, the commission has gathered a disturbing array of indicators of the nation's educational failings:

► Some 23 million American adults are functionally illiterate by the simplest tests of everyday reading, writing, and comprehension. About 13 percent