NSF Worries About Its Federal Partners

Princeton University cosmologist Jeremiah Ostriker got some bad news last week. He was counting on the Defense Advanced Research Projects Agency (DARPA) to provide 20% of his $725,000-a-year grant from the National Science Foundation (NSF) to use supercomputers in analyzing the formation of galaxies and other large structures. But NSF officials told him the defense agency wasn't going to come up with the money for the last 2 years of his 5-year "Grand Challenge" award, which began in 1993 (*Science*, 24 June 1994, p. 1845). Now Ostriker and his collaborators at five other research universities face their own grand challenge: how to support more than a dozen graduate students and postdoctoral researchers on a shrunken budget. "These are the next generation of scientists, doing excellent work," he says. "And now we may have to let some of them go."

Ostriker's plight is a small piece of a larger problem facing NSF, which has worked hard in recent years to supplement its $3 billion budget by building ties with several federal agencies. Last year those agencies contributed $297 million to NSF projects, the second biggest source of outside support after academic institutions. What scares NSF in this era of federal belt-tightening is that DARPA will be one in a string of partners who break those ties as their own programs are slashed. And if that happens, NSF doesn't have the resources to pick up the whole tab itself. Its 1996 budget—which still hasn't been settled—is expected to fall some $80 million below last year's, and the 4.6% increase the president requested this week for 1997, even if it were to be approved by Congress, would barely make up for 2 years' worth of inflation.

IRIS

Filling holes. NSF strives to increase support for interagency global network of seismographic stations like this one in Fiji.

Take the case of the Grand Challenge awards program, which consists of some 16 interdisciplinary projects jointly funded by DARPA and NSF to use supercomputers in everything from designing new materials at the atomic level to modeling the largest structures in the universe. This year DARPA's Information Technology Office saw its $300 million budget shrink by 20%, prompting the office to put highest priority on research with a direct military payoff. The Grand Challenge program didn't fit into that category. Neither did a program in which DARPA was paying $2 million a year to support technology development at two of NSF's four supercomputing centers. Both got the ax. "If we had unlimited resources, I'd still be supporting them," says Howard Frank, head of the DARPA office. NSF officials told a House subcommittee earlier this month that they didn't know if they could make up DARPA's share. "That shared funding is very important in computing," said NSF Director Neal Lane.

The computing program is not the only area of NSF feeling the cold fiscal wind that's blowing through the federal government. The geosciences seem particularly vulnerable because so much fieldwork is carried out in cooperation with other agencies. "There are some pretty scary things going on in other agencies," Robert Corell, head of NSF's geosciences directorate, told the House panel. For example, this year the Department of Energy (DOE) is phasing out its $800,000 a year support for an interagency continental drilling program with NSF and the U.S. Geological Survey (USGS) because the House science committee's energy panel decided "this program has limited relevance to DOE's energy mission." DOE's Bill Luth, who runs the programs, says "We're hoping to do complementary work as part of a continuing relationship with NSF, but we can't spend it on drilling."

NSF officials are also worried about finding the money to complete and maintain a global seismic monitoring network, built over many years with the help of the Department of Defense (DOD), that can monitor underground nuclear tests as well as do basic science. This year's $9.5 million payment is DOD's last, however, leaving NSF to make up the difference with a hand from the USGS. But USGS's budget is under heavy pressure, and NSF, which already provides $7.5 million, will be hard-pressed to come up with the additional $7.5 million that the contractor, Incorporated Research Institutions for Seismology (IRIS), has budgeted next year for new stations, plus upgrades and routine maintenance at more than 100 stations. "It's got to be new money," says Ian McGregor of NSF's geosciences directorate.

Budget pressures at USGS may also strain NSF's ability to support its traditional audience of academic researchers. Next month, for example, Stanford University's Mark Zoback and USGS's Stephen Hickman and Bill Ellsworth hope to submit a $10 million proposal to NSF for the first-ever deep drilling into an active fault, a 2.5-kilometer hole into the San Andreas fault at Parkfield, California.

Although NSF was always their primary funding target, the scientists initially hoped to increase their chances by having USGS pick up a large share of the tab. "At one point we had talked about USGS contributing an equal share," says Hickman, "and I don't think it would have taken much of a sales job if USGS was flush. But now it's up to NSF to decide if the idea is good enough to fund." USGS will still be asked to provide salary support for some two dozen researchers, however, and DOE may kick in funds for development of in-hole instruments. The team also hopes to get some support from a new, International Continental Drilling Program whose founding members are the United States, Germany, and China.

Officials in agencies that are cutting back on joint projects with NSF point out that some of their own programs may offer new opportunities for affected researchers. DARPA's Frank notes, for example, that his office is rapidly expanding funding for research designed to make information networks more capable of surviving a nuclear attack—up from $10 million to $40 million in 2 years. "I know it's not for everybody, but I would hope that some people who need to feed graduate students would recognize the opportunity," says Frank. Not Ostriker. DARPA has a right to change its mind, he says, but a heads-up would have been nice. And he's not interested in changing direction. "We've already been phenomenally successful," he says. "In the past few years a new discipline has been born, and I plan to stay involved in it," with or without DARPA's help.

–Jeffrey Mervis