NATIONAL SCIENCE FOUNDATION

Congress Puts the Squeeze On NSF's Oversight Board

The National Science Board finds itself walking a political tightrope in a dispute between NSF and Congress over managing the growing foundation

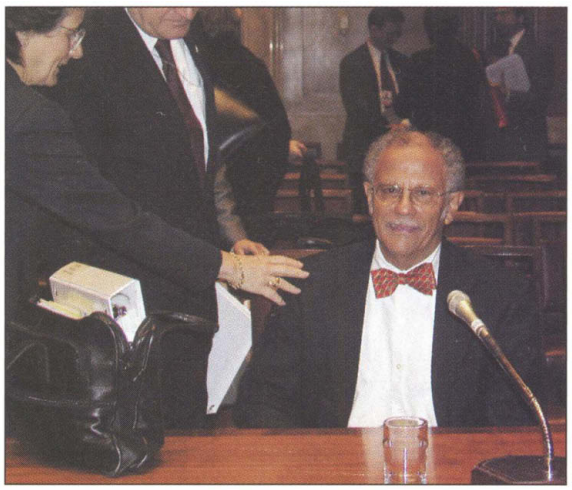
This year was shaping up to be a breakout season for the National Science Board, which oversees the National Science Foundation (NSF) and provides free advice to the government on national science policy. After toiling for a half-century in relative obscurity, the board seemed well positioned to capitalize on NSF's favored status among Washington politicians. In February NSF earned a gold star from the Bush Administration for its management prowess (*Science*, 8 February, p. 953), and both houses of Congress are pushing ahead with a bill that endorses doubling its budget (*Science*, 27 September, p. 2187).

But so far there have been more headaches than hosannas for Warren Washington, who in May became chair of the presidentially appointed body. A senior scientist at the National Center for Atmospheric Research in Boulder, Colorado, he hasn't had much time to bask in the foundation's reflected glory. Instead, he's become the board's chief navigator through a suddenly perilous political passage.

His biggest challenge is to strike a compromise between NSF's director and Congress, which is weighing proposals that give the board greater resources and independence. Legislators want the board to more aggressively oversee the foundation, whose $4.8 billion budget might soon be growing rapidly, and the House has already approved some proposed changes. Its director, Rita Colwell, is adamantly opposed to these ideas, however, on grounds that the status quo has served the process well.

The board is caught in the middle. Its initial reaction was quite negative (*Science*, 23 August, p. 1257). But recent interviews by *Science* with several members suggest that a substantial minority favors more authority and independence—although everybody wants to avoid doing or saying anything that might jeopardize NSF's chances for sustained budget growth. Several members also expressed concerns about Colwell's role in replacing the board's executive officer earlier this summer. Washington is trying to plot a course through these currents with the narrowest of mandates: He earned the job in a one-vote victory over University of Virginia computer scientist Anita Jones, the closest election for board chair in recent memory.

Congressional attention of any kind is a novelty for the part-time board, a unique body created by the law that established NSF in 1950. Its 24 members, typically well-regarded researchers or administrators from academia and industry, are chosen by the president and confirmed by the Senate for staggered 6-year terms (www.nsf.gov/nsb). The board meets six times a year to approve large awards, generate the occasional report about scientific affairs of the day, and discuss long-term strategy. It also signs off on NSF's annual budget request to the president.



Tag team. Board chair Warren Washington, with NSF Director Rita Colwell, testified before the Senate this spring on NSF's proposed 2003 budget.

"The science board and the director are the two pieces that make up the foundation," says Neal Lane, Colwell's predecessor and former science adviser to President Clinton. But the director chairs the board's executive committee and supervises the board's nine-member staff. "The director has a huge influence," says Richard Zare, a Stanford University chemist who chaired the board from 1996 to 1998. "But she also has to work with the board."

Legislators have worried for some time that the balance of power was tilting toward the director, threatening to weaken the board's ability to exercise proper oversight. At the same time, they were concerned about how NSF selects and manages large research facilities, reflecting complaints from constituents that their projects had been approved by the board but had not yet been included in NSF's budget request. After a hearing last year on the subject (*Science*, 27 July 2001, p. 586), the House in June passed a bill that tackles both issues, ordering the director to rank the various projects by priority after consultation with the board. The language was picked up in July by Senate appropriators, who called for "a more open and understandable process" of explaining how NSF chooses from the large number of requests that bubble up from the community and pass muster with reviewers.

The Senate bill tightened the screws by creating a separate budget for the science board. Last month, two more Senate committees approved an NSF reauthorization bill that, in line with the earlier panel's wishes, would give the board authority to hire its own staff. The changes, says a Senate aide, are meant to shore up the board's oversight capability at a time when NSF's budget is poised to grow rapidly, and when corporate scandals such as Enron and WorldCom have made it clear that a board of directors should be more independent of the company's officers.

The changes would damage the relation between the board and the director, says Colwell, a University of Maryland microbiologist who has served 4 years of a 6-year, presidentially appointed term. They would add bureaucracy, end the board's current practice of borrowing NSF staff for reports and short-term projects, and create a gap between board and NSF where none now exists. "Nothing is broken, and there's nothing to be rectified," she told *Science*. "This relationship has been revisited several times, and every time the conclusion is the same: It works. I'm very happy with the way things work right now."

The board harshly criticized the proposed changes at its August public meeting, saying that they were unnecessary and potentially harmful. John White, chancellor of the University of Arkansas, Fayetteville, led the attack: "At first I thought they might be catastrophic. Now I think they're only redundant." Board members also worried about the increased responsibilities and cost of managing their own affairs.

But in recent interviews with several board members, *Science* has found guarded support for many of the suggested changes. "I absolutely think that there is very strong value in some of them," says Jane Lubchenco, an ecologist at Oregon State University,

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Corvallis. "Both the scientific community and the NSF would be better served if the board were more independent." Stan Jaskolski, a retired executive at Eaton Corp. in Cleveland, Ohio, says that the board now lacks the ability "to meet by itself, independent of the management of the foundation, … to discuss key emerging issues and challenges. The system is not broken, but we need to constantly seek to improve it."

Some board members say the recent departure of Marta Cehelsky, the board's longtime executive officer, points up the need for greater autonomy. Soon after Washington became chair, Colwell shuffled the board's staff. Cehelsky is now on leave at the Inter-American Development Bank in Washington, D.C., helping incorporate science into long-term planning, and longtime NSF staffer Gerry Glaser serves as acting executive officer. "I was disappointed when Rita decided to remove Marta," says Diana Natalicio, president of the University of Texas, El Paso, and vice chair of the board. "We lost a person we respected, and one who had a lot of experience. That leaves a void."

Colwell says the move was made with Washington's approval. "It was time for a change," she says. "We agreed that it was time for him to have his own staff." Washington has a different recollection of events. "The idea of changing board personnel was her idea, and the change was made much faster than I would have wanted," he says. "There was some period of transition, but it wasn't ideal."

Although Washington has spent 8 years on the board, the 66-year-old climate modeler says he's still a political naïf who faces a steep learning curve. Dispatched by the board last month to Capitol Hill to learn the legislators' intent, Washington spent most of the time listening. "He was trying to take our temperature," says one House staffer. "He said that some board members think [the changes] are not a bad idea and that the board would continue to talk about it." Washington's assessment is typically understated: "I'm impressed with how seriously people on [Capitol] Hill are taking the board's responsibility to oversee the foundation."

The board's penchant for secrecy has traditionally kept any conflicts bottled up within the board's home at NSF's headquarters in suburban Virginia. But that might be changing. In June the House called on the board to conduct more of its business in public, and Washington says he is already thinking about how to do that. "I want to go back to a time of greater openness in discussing controversial topics," he says.

Washington also takes a philosophical view of possible changes in the board's status. "I think that most of the board still feels that these changes aren't necessary," he says. "But if they get adopted, we can live with them. The important thing is the increased funding for NSF. That's the big news."

The fate of both NSF's budget and the board's authority over it now rests with Congress, which must reconcile competing versions of both spending and authorization bills. Only then will Washington and the science board learn what they have to live with.

—JEFFREY MERVIS

HIGH-ENERGY PHYSICS

Neutrino Hunters Borrow Military Ears—and Eyes

Undersea listening devices and an aging spy satellite are helping physicists look for ultrahigh-energy neutrinos

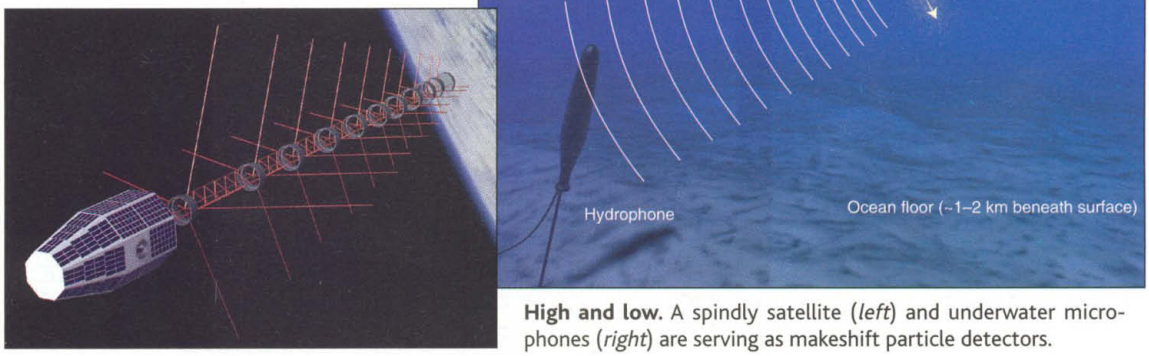
A decade ago, nobody was sure they even existed. Ultrahigh-energy neutrinos, almost-undetectable particles moving so fast that they can carry as much energy as a baseball pitch, were a theoretical possibility—nothing more. Nobody had any way to spot them, and nobody could even guess what an instrument designed to detect them would see.

But that's ancient history. Now physicists are firmly convinced that Earth is constantly being bombarded by ultrahigh-energy neutrinos, which are part of the debris generated when extremely energetic cosmic rays slam into the atmosphere, water, or rock, creating showers of particles. The neutrinos could give physicists valuable clues to the source of the cosmic rays that spawned them—one of the most vexing unknowns in modern astrophysics.

Several experiments that can sense ultrahigh-energy neutrinos are planned, but they are years away. However, scientists are already searching for the particles, thanks to military hardware designed to snoop on a Cold War enemy. Using data from sources such as a submarine-listening facility and an aging spy satellite, a handful of shoestring projects are quietly paving the way for higher profile efforts soon to come—and could well beat them to the punch.

"They're extremely nice and cooperative," says physicist Giorgio Gratta of Stanford University of his U.S. Navy benefactors, who have given his lab at Stanford and physicists at the Scripps Institution of Oceanography in La Jolla, California, access to a 250-square-kilometer array of underwater microphones, or hydrophones, based at the Atlantic Undersea Test and Evaluation Center (AUTEC) in the Bahamas. During the Cold War, the U.S. and Soviet navies sprinkled such acoustic arrays throughout the world's oceans in hopes of tracking enemy submarines. Now Gratta and colleagues think they might pick up the much subtler acoustic waves generated when particle showers triggered by incoming neutrinos heat up seawater, causing it to expand.

To make an audible click in the ocean, a neutrino must carry a huge amount of energy: 10^{16} electron volts (eV), enough, perhaps, to knock an ant into the air. Until recently, most astrophysicists didn't think such neutrinos existed; no cosmic rays packed enough of a wallop to create them. But in



High and low. A spindly satellite (*left*) and underwater microphones (*right*) are serving as makeshift particle detectors.

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