

would be reserved for immigrants without family connections who qualify because of their skills and education, such as outstanding artists, scholars and scientists. Under the Senate rubric, Chinese students could be favored. Ironically, a century ago, US immigration rules were written to specifically keep out Chinese and other Asians. The House of Representatives is preparing its own bill. The two versions are not all that far apart.

Also in the House, Democratic Congresswoman Nancy Pelosi, whose constituents in San Francisco include the largest community of ethnic Chinese in the US, introduced the Emergency Chinese Visa Adjustment Act of 1989, which, like the Mitchell-Dole amendment, waives the requirement that students on J-1 exchange visas must return to their home country for two years before applying to return to the US. Pelosi's bill was immediately endorsed by Chinese student associations on 118 campuses and co-sponsored by 158 House members. A bill similar to Pelosi's was introduced in the Senate by Alan Dixon and Paul Simon, both Illinois Democrats, and co-sponsored by three other Democrats, Brock Adams of Washington, Christopher J. Dodd of Connecticut and Bill Bradley of New Jersey.

A rescue operation

Meanwhile, the National Science Foundation invited PRC graduate students, postdocs and other scholars to apply for supplemental funds to cover any financial hardship that arises from the President's one-year extension. In a letter on 15 June to university officials, the foundation's director, Erich Bloch, suggested they send a brief letter, signed by the principal investigator and an institutional official, setting out the circumstances that would require supplemental funds.

NSF's rough estimates for the num-

ber of students who might be affected come to 230 postdocs, virtually all of them in physics, astronomy, materials science, chemistry and mathematics, along with 600 grad students, about three-fourths of them in those same fields. Bloch has agreed to "find" as much as \$2 million from "odd bits of programs in the foundation" to cover the rescue operation.

After one month, NSF officials admit "we are somewhat surprised by the response." Only about 50 requests for supplemental funding have arrived by mail. As casualties of the turmoil, Chinese students at home and abroad are learning some painful lessons. In the wake of the crackdown in China, all assumptions about scholarship and society in the PRC "probably have to be seriously rethought," says Michel C. Oksenberg of the University of Michigan's Center for Chinese Studies. In the past decade, China was gradually emerging from its long nightmare of wars, repression and deprivation, he observes. A new generation of young men and women was emerging, with few scars from the terrible history of the country. They believed a more open and modern China was possible. Now, science may be set back a whole generation, says Oksenberg, if students and researchers are reluctant to return.

From the PRC perspective, some Chinese students in the US have acted provocatively. One group at Princeton University issued a proclamation on 13 June that stated in part that the signers no longer recognized the government of Prime Minister Li Peng. Chinese students, for their part, claim they have received vague threats from anonymous callers and have been under intense surveillance by PRC embassy and consular officials. The harassment has taken several forms—from a man watching for hours from a car parked in front of a house near Boston where Chinese

graduate students operate a communications center, to telephone calls that warn students that their career or life is in danger, to visits to university campuses in search of the identity of students and scholars involved in prodemocracy activities. After listening to complaints about incidents of harassment from Chinese students from the San Francisco area, Congressman Lantos wrote to Secretary of State Baker asking for an investigation of the Chinese embassy in Washington and its five consulates around the country.

Several members of Congress have spoken with officials at the embassy, including Ambassador Han Xu about the alleged incidents. Han, who has served in Washington for more than four years, was recalled to Beijing in early July as part of a general meeting of PRC ambassadors. In his case, Han was dismissed.

'A lenient approach'

The PRC embassy rejects the allegations by Chinese students. In mid-July it released a memorandum stating: "It is our consistent position to oppose any kind of monitoring, harassing or intimidating of overseas Chinese students, directly or indirectly." At the conclusion of the memo, the PRC embassy said: "The Chinese government has announced that it will take a lenient approach towards those students who, without knowing the truth, participated in demonstrations or rallies in the United States and that it will not look into their cases at all."

When questioned about the memo's contents, Chinese students on university campuses and at government labs tend to laugh cynically. A Chinese astrophysics researcher at the University of California in San Diego cracked, "If you believe that, you'll believe the world is flat."

—IRWIN GOODWIN

OUT OF THE WRECKAGE, A 100-METER RADIOTELESCOPE IS BACKED BY CONGRESS

Even as workmen were clearing away the heap of rubble from the 300-foot radiotelescope near Green Bank, West Virginia, which collapsed last November when a steel plate fractured between a leg and the collecting dish, Congress was putting up funds to build a powerful new 100-meter replacement. On 23 June, the House of Representatives, by a vote of 318 to 6, passed a \$3.5 billion fiscal 1989 "dire emergency" supplemental ap-

propriations bill containing \$75 million for the new telescope. Once President Bush signed the bill into law on 30 June, the National Science Foundation was assured of getting half the appropriation this year and the remaining half after the new fiscal year begins on 1 October, so that the agency can replace the wrecked telescope with a new one without drawing on its own prevailing budget.

How this was achieved is a case

study in the ways of Washington. On 21 April, NSF's Advisory Committee for Astronomical Sciences, led by Arthur B. C. Walker Jr of Stanford University, agreed that although a replacement for the Green Bank radiotelescope was not the highest priority for astronomy, it ought to be funded. In doing this, the committee said, the new telescope should not impinge on the already pinched budget of the agency's astronomy pro-

gram, however. The committee noted that "the construction and operation of a 100-meter-class radiotelescope [should] be accomplished with 'add-on' funds to the NSF budget" because "this emergency situation has occurred in the midst of a crisis in the general support of basic research in astronomy." NSF's budget this year allocates \$89.5 million for astronomy, of which \$30.1 million goes to the National Radio Astronomy Observatory, which operates the Green Bank facility.

New money

The ruined radiotelescope was built in 1962 for \$850 000. Even accounting for inflation over the following 27 years, the new 100-meter replacement would cost considerably more. An NRAO study group concluded this spring that for \$75 million, NRAO would get considerably more in performance (PHYSICS TODAY, April, page 55). While NRAO expects to spread construction over six years, in the peak spending year, fiscal 1991, construction costs are likely to come to \$17.8 million, more than half of its current budget. In the event, new money would be essential.

Informed of this, West Virginia's senators, Robert C. Byrd and Jay Rockefeller, both Democrats, argued for the facility in terms their colleagues understand on Capitol Hill: The loss of the 300-foot instrument created an "emergency situation within the scientific community and the state of West Virginia," they explained in a joint statement. Its prompt replacement, they declared, would provide the "best promise for jobs, education, tourism and scientific prestige" for the state. In particular, the views of Byrd, who gave up his position as Senate majority leader last January to become chairman of the Senate Appropriations Committee, carry a weight in Congress that belies his diminutive size.

Byrd seized the opportunity to get money for Green Bank when the 1989 supplemental spending bill came up before his committee. But his \$75 million amendment was perceived by other committee members as "pork" in a bill that they wanted to rush through Congress to serve up veterans' benefits and drug crackdowns. Faced with opposition, Byrd, in a last-minute compromise, agreed to defer half of his requested amount until 1990.

The same day the supplemental appropriation became law, Associated Universities Inc, the consortium that runs NRAO, submitted its final proposal for the new telescope to NSF.



Byrd: Designing for West Virginia

The proposal, prepared by a team headed by George A. Seielstad, NRAO's assistant director for Green Bank, outlines the cost, design and construction schedule for the new instrument. A design group led by Lee J. King, a structural engineer at NRAO, expects to complete the preliminary design work by the end of the year. Details have not yet been decided, but AUI may go for some unconventional features, such as motorized reflector panels and an offset feed structure that can send reflected signals to the electronic detectors. Technological advances will enable astronomers to observe at wavelengths as short as 3 mm with high resolution, compared with the 60-mm wavelength limit of the old telescope.

Seielstad: Designing a radiotelescope



Paul A. Vanden Bout, NRAO's director, is confident that the new radiotelescope will cost no more than \$75 million, but he emphasizes the importance of moving quickly to minimize inflationary effects. Preliminary figures indicate that construction will cost \$51 million; data processing, instrumentation and management expenses will total \$7 million; and the remaining \$17 million will cover overruns and inflation.

Pork aroma

By bypassing the traditional peer review process for NRAO's project proposal, NSF seems to have contributed to the aroma of "pork" cooked up by Byrd and Rockefeller. But John A. Moore, NSF's deputy director, argues that the recommendation by the Walker advisory committee can, "in a sense," be considered a peer review. Erich Bloch, the agency's director, told the House Appropriations Committee last March that the foundation's top priority for a new scientific facility is not a replacement telescope but the Laser Interferometer Gravity Wave Observatory, a project NSF hopes to begin building in 1991. He said Green Bank was a possible site for the LIGO in the eastern US.

The replacement telescope also received a low ranking in the long-range plan prepared by an internal NSF group. This group preferred upgrading the aging Arecibo radiotelescope in Puerto Rico, an NSF facility operated by Cornell University, or quickly completing NRAO's \$81 million Very Long Baseline Array, a network of ten 25-meter radiotelescopes located in Hawaii, the continental US and the US Virgin Islands.

Vanden Bout believes funding the 100-meter will strengthen support for other radioastronomy projects. "I think it helps the Arecibo case," he said, noting that the 1000-foot Arecibo radiotelescope offers limited pointing capability but unmatched raw collecting power. With an improved reflecting surface and support systems, the Arecibo telescope could significantly complement the capabilities of the fully steerable but less sensitive 100-meter antenna.

Unlike the nonsteerable Arecibo telescope, the 100-meter telescope will be able to scan the Galactic center, where globular clusters containing millisecond pulsars are concentrated. The new telescope can also be linked with the VLBA, Vanden Bout points out, thus multiplying the array's total collecting area, and hence its sensitivity, by a factor of more than two-and-one-half.

—COREY S. POWELL