from NIH, you must apply through established channels. "The application from Duke University was submitted to NSF in response to an announcement by the NSF that did not involve the NIH," Bowen added.

Last summer, state government officials in North Carolina tried to resolve the impasse by brokering an agreement with Duke and the North Carolina Biotechnology Center, a clearinghouse for research funds from various sources. The state-supported center pledged $1.6 million to the Duke-NSF engineering center over 5 years. In addition, industry has promised support and NIH already is funding cardiovascular research at Duke at a rate of more than $2 million a year in regular grant support. It all adds up, de facto, to the one-third co-funding that NSF is demanding.

But NSF has not agreed to see that as a compromise. "State money is something extra," NSF's Lih told *Science* recently. "It's nice, but it is not a substitute for NIH money." Said Lih, "Actually, the rationale of the NSF management's position to get NIH funding is to leverage other agency funding. That is why NIH money is specified."

For now, it looks as though Duke is prepared to move ahead without the full funding it originally expected from NSF. On 2 October, the university finally announced that it had signed an agreement with NSF to launch the Engineering Research Center for Emerging Cardiovascular Technologies. The announcement said that NSF will provide up to $9.33 million over the next 5 years, conspicuously leaving out the fact that at full funding the figure would have been $14 million. For the current fiscal year, NSF will advance Duke $667,000 to begin the center's operations—about half what it would get were NIH to meet NSF's demands.

The Duke center has until next September to get more NIH money. If it gets the full one-third support from NIH—that amount also works out to $667,000—NSF will provide a matching supplement. If NIH provides less than one-third, NSF will contribute proportionately less. Pilkington says that Duke has now made formal application for new NIH money that would go to research "closely related" to the center's planned program.

In any case, Duke has every intention of moving ahead with its research aims, which include a new generation of implantable cardiac devices, such as defibrillators, and real time, three-dimensional diagnostic ultrasound imagery of the heart. ■

MONTE BASGALL

Monte Basgall is the science reporter for The News and Observer *of Raleigh, NC.*

SDI Experts Clash On Nuclear Satellites

Taking a shot at critics of SDI, Lowell Wood seems to have knocked out instead the rationale for a space-based reactor

LOWELL Wood, a senior scientist at the Lawrence Livermore National Laboratory and a leading supporter of President Reagan's Strategic Defense Initiative (SDI), has been firing verbal volleys at SDI critics but may inadvertently have hit the wrong target: a key program to develop nuclear reactors to power SDI satellites.

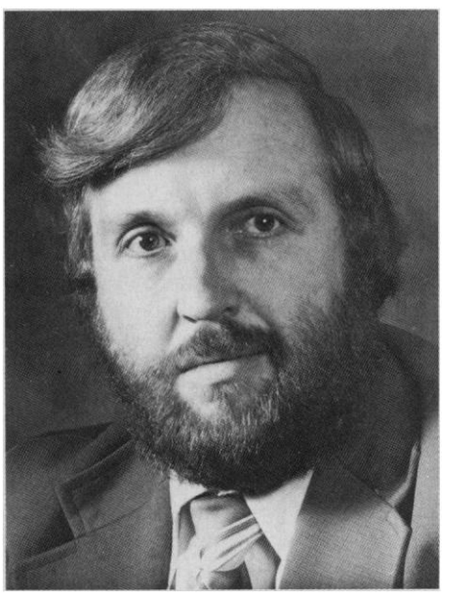
Some SDI critics have argued that providing sufficient power to operate strategic defense satellites will be a major problem, requiring small nuclear reactors that lie well beyond the current state of the art. Since such reactors will take many years to develop, the need for them could delay SDI deployment.

These arguments received support earlier this year from a high-powered committee established by the American Physical Society (APS) to evaluate the state-of-the-art of lasers, particle beams, and other so-called directed energy weapons. The committee said that many SDI satellites would require between 100 and 700 kilowatts of "housekeeping" power in peacetime, and that about 100 nuclear reactors would be needed as part of a strategic defense system.

Wood claims, however, that the weapons platforms currently under consideration by the SDI Office need so little power that solar panels could do the job. Futuristic reactors are not essential, he says.

In hearings held in mid-September by a House armed services subcommittee, Wood lambasted the APS report, claiming that the 100- to 700-kilowatt figure was a product of the committee's "collective imagination." The committee was briefed by SDI officials on satellite power needs he said, and "they had been informed that housekeeping requirements were at most 15 kilowatts for all the systems under serious consideration, and were under 50 kilowatts even for platforms not at the forefront of consideration."

This came as a surprise to some members of Congress, because they have been assured by the Department of Energy and SDI officials that space-based reactors are essential for SDI. Congress has been approving funds for a multimillion dollar program in DOE to develop space reactors in part on that basis. For 1988, DOE has requested $70 million to develop a reactor called SP-100, more than 150% over the 1987 budget.



Lowell Wood. *Testified in September that nuclear-powered satellites are not needed.*

Representative Edward Markey (D–MA), a critic of SDI, promptly wrote to Energy Secretary John Herrington asking him to explain why he has been telling Congress that the program is needed to meet SDI power requirements when a senior SDI scientist says the Pentagon's own studies show that it is not.

On 28 October, Joseph Salgado, Herrington's deputy, responded with a letter stating that the department takes "strong exception to Dr. Wood's claims." Salgado said there are no documents that specify that all housekeeping power requirements will be below 15 kilowatts. "There may be some people who have the same view as Dr. Wood . . . but the official documents provided to us and the decisions made in concert with the director of SDIO [the SDI Office] indicate that higher power levels are required."

Salgado said in detailed answers to questions Markey posed that "to the best of the department's knowledge, present SDI studies indicate a range of power requirements from a few 10's to over 100 kWe [kilowatt

electric] for non-burst power duty requirements." Wood has asserted that the APS committee was "informed that already deployed DOD [Department of Defense] solar-electric power systems were adequate to meet each and every one of these [housekeeping power] requirements," but Salgado says that "solar power cannot meet all of the 'housekeeping' power requirements for 'Star Wars' space-based assets."

A member of the APS committee says that it was told by SDI officials that the power requirements were on the order of 100 kilowatts, with some ranging considerably higher. The 700 kilowatt upper range cited in the report included power for radars, he said. Wood claims, however, that "SDI has no plans for radars on *any* of the satellites in *any* of its baseline architectures." The APS committee member says "for some of the architectures we were interested in, radars are definitely included," and Salgado's letter also notes that radar operation is one of the housekeeping power requirements.

Wood did not return several telephone calls from *Science*, but Gregory Canavan, a Los Alamos scientist who has worked closely with Wood on critiques of the APS report, says of Salgado's letter "that's a guy defending his program." Canavan argues that satellite power requirements are usually overestimated in the early stages of development. Thus, the debate over SDI has taken an ironic twist in which Administration officials have undermined the credibility of some of SDI's strongest supporters who themselves have undermined the credibility of a key SDI program.

It is not the first time that Woods' outspoken advocacy of SDI programs has raised controversy. Roy D. Woodruff, the former associate director for defense systems at Livermore, has accused Woods and Edward Teller of conveying "overly optimistic and technically incorrect" information on the x-ray laser program "to the nation's highest policy makers."

The accusations were made in a memo Woodruff wrote in April, 1987 as part of a grievance proceeding he initiated against Livermore director Roger Batzel. The memo was released recently without Woodruff's consent by the Southern California Federation of Scientists. Woodruff resigned as associate director in 1985 because, he claims, Wood and Teller "engaged in numerous actions that undercut my management responsibility for the x-ray laser program." He says he was subsequently demoted to an entry level position and Batzel failed to honor an agreement to make known within the defense and university communities the reason for his resignation. ■

COLIN NORMAN

New Questions About AIDS Test Accuracy

If routine testing of populations at very low risk for AIDS is carried out under present conditions, an increasingly high percentage of false test results can be expected

ACCORDING to recent testimony before a House subcommittee, blood tests for AIDS among low-risk individuals are even less accurate than critics have previously feared. In particular, an inexperienced laboratory's ability to do the Western blot assay—held by many to be the gold standard confirmatory test for having antibodies against the AIDS virus—is now under attack. At this point, however, it is difficult to evaluate the true extent of the problem because no one knows precisely how many blood tests for AIDS are being performed by highly qualified versus substandard laboratories.

Nevertheless, two striking findings emerge from the hearing. First, the Western blot test, at least in the wrong hands, is not as reliable as many have assumed. And second, laboratory proficiency in performing AIDS antibody tests, especially the technically difficult Western blot, is highly variable and sometimes completely unacceptable. At present, these problems are compounded by the lack of quality control and differing standards for interpreting test results. An added concern is that the problem of false test results may worsen as a growing number of inexperienced laboratories enter the for-profit AIDS testing market.

Whether or not these issues will have any impact on President Reagan's proposal for states to do routine testing of marriage license applicants, patients entering hospitals, and prisoners is still unclear. But politicians opposed to the notion of federally mandated testing can use the "accuracy-in-testing" issue as ammunition.

The accuracy of AIDS testing was explored at a hearing last month by the subcommittee on regulation and business opportunities of the House Committee on Small Business chaired by Representative Ron Wyden (D–OR). "I think we are going to need more testing," said Wyden in an interview with *Science*. "I am not antitesting. But to me the prerequisite is to increase the accuracy of testing." Wyden also stated that he would support legislation now being drafted by Representative Henry Waxman (D–CA) that calls for increased federal funds for voluntary testing and counseling, as well as protection of confidentiality and nondiscrimination of people who test positive.

Most blood tests for AIDS measure antibodies against human immunodeficiency virus (HIV), the virus that causes the fatal disease. At present no method exists for measuring the virus directly. The first in a series of blood tests is an ELISA, or enzyme-linked immunosorbent assay, which mea-

Lawrence Miike. *OTA official sees a high ratio of false positives in AIDS testing*

Donald Burke. *Army researcher favors testing low-risk groups: "We can make it work."*