advocate the desirability of negotiating directly with the Soviets on what is permissible under the treaty. At a AAAS arms control symposium last September, for example, he said "the whole theory of the treaty was that when something like this arises, we would talk to the other side about it."

The Department of Defense has, however, been vehemently opposed. Frank Gaffney, who was nominated by former Defense Secretary Caspar Weinberger to succeed Richard Perle as an assistant secretary of defense for arms control, was among the more forceful foes. Gaffney, who is now a resident fellow at the American Enterprise Institute, said in an interview, "we have the right under the treaty to conduct a wide range of research, development, and testing activities. There is no way but that these rights would be circumscribed by negotiating limits." Moreover, because it would be difficult to verify adherence to the kind of performance limits proposed by the Soviets, Gaffney contends that "we would be accepting limitations that would apply unilaterally to the United States."

Ashton Carter, a physicist at Harvard's Kennedy School of Government who has been advising Nitze, argues, however, that a regime establishing limits under the traditional interpretation of the treaty need not be unduly restrictive. "People don't adequately appreciate what can be done within the treaty for testing space weapons," Carter says, noting that tests can be configured to fit into the permissible categories of work on fixed ground-based systems or antisatellite weapons.

An example is a test planned for 1990 in which a small heat-seeking interceptor launched from a rocket at Kwajalein will home in on a second rocket and destroy it in a fiery collision. This would be the first major test of the ability to use a space-based missile to hit a rocket in its boost phase—while its engines are still firing and before it releases its warheads. Unlike the AOA experiment, however, this test has prompted little concern about potential violation of the ABM treaty because it is a ground-based test at a designated test range.

Carter points out that the determination of what SDI testing is permissible rests on unilateral U.S. definitions of the treaty's terms. Like Graybeal, he argues that it would be in the best interests of the SDI program to negotiate what is permissible. "My own view is that such an approach is inevitable," he says.

Any movement toward establishing such limits is, however, not considered likely until the next Administration, when most of the tests that have raised concerns would take place. ■ COLIN NORMAN

Texas Wins R&D Center

Texans may brag that their state capital is also becoming the capital of U.S. electronics R&D after Austin was chosen as the location for a national semiconductor manufacturing research venture. Austin is already the site of the Microelectronics and Computer Technology Corporation (MCC), an electronics industry research cooperative.

The new undertaking, with the acronym Sematech, for semiconductor manufacturing technology initiative, is intended to insure U.S. capabilities in producing advanced semiconductors for military and civilian purposes and bolster U.S. competitiveness in world markets. It is sponsored by a consortium of 14 major semiconductor industry companies with funding from industry, the Department of Defense (DOD), and state and local sources.

An annual operating budget of $250 million is projected for Sematech, half from member companies and half from federal, state, and local governments. The Sematech board selected the site on 5 January after federal funding of $100 million this year was voted 2 weeks earlier by Congress.

Sematech will have three main missions: to carry out R&D on advanced semiconductor manufacturing techniques, test them on a demonstration production line, and transfer the techniques to U.S. producers. Members of the consortium will have first call on Sematech developments.

National security considerations persuaded DOD to take the unusual step of directly funding a partnership with industry (*Science*, 6 November 1987, p. 748). DOD is concerned that the loss of markets by U.S. semiconductor firms to Japanese competitors could result in the erosion of U.S. technological leadership, making the U.S. military dependent on foreign suppliers for advanced microelectronics components.

The Texas proposal was chosen from among 12 finalists. Originally, 135 sites in 34 states had been proposed. The head of the site selection committee, Sanford L. Kane, IBM general technology division vice president, declined to discuss the comparative merits of the competing proposals. He was quoted, however, as saying "Texas had the most solid proposal across the board, in all areas of our criteria."

Last fall, Kane said that, in addition to financial incentives offered by the states competing for the award, criteria for selection would be adequate facilities and utilities, ties with nearby universities to provide research support and educational opportunities for Sematech employees, and quality of life considerations.

The financial inducements offered in the Austin proposal were valued at more than $60 million. Included in the offer was use of a plant built in Austin by Data General but never occupied. The University of Texas played a central role in the Texas drive to land Sematech by making $15 million in university funds available and agreeing to guarantee $35 million in bonds which the state legislature authorized. Asked why Sematech chose Austin, University of Texas provost Hans Mark noted that the university has a strong electrical engineering program and said he thought "another reason they liked us was that we had recognized the problem and made our own investment." He said the university planned a facility for electronic device packaging research and the regents had approved $20 million for a building. Mark also observed that the presence of MCC in Austin offered a unique opportunity for "synergism."

Snaring Sematech with its $250-million annual budget is viewed as a significant boost to Austin and the Texas economy in general. The direct yield is estimated at 800 to 1000 jobs and Sematech is expected to attract more firms to the area.

American electronics companies have traditionally competed fiercely with each other and resisted collaboration on research. James Meindl, provost at Rensselaer Polytechnic Institute and a member of the Defense Science Board task force that called for an initiative in the Sematech mold, notes that the U.S. semiconductor manufacturing equipment industry is "extremely fragmented," and the cost of research is escalating.

This trend is likely to give incentive for U.S. companies to support Sematech, says Meindl, since "Tooling costs for a semiconductor manufacturing line are getting so large that," that even the biggest American companies will be "pleased to continue in Sematech." ■ JOHN WALSH