used for location-fixing purposes by high-frequency direction-finding stations in Soviet territory," he says. Similarly, Richard Garwin, a physicist at IBM with long experience in weapons design, says that Soviet eavesdropping can be defeated by high-frequency, short wavelength, broad-spectrum radio signals, generated by focused antennas and relayed from one U.S. satellite to another. "The U.S. ASAT is not needed to defeat this threat," he says.

Given the apparent defects in the Administration's stated justification for the U.S. ASAT, there is considerable speculation that its proponents like it because its development offers a convenient cover for antiballistic missile (ABM) research that would otherwise be prohibited by the ABM treaty. This theory was given a boost several weeks ago by presidential science adviser George Keyworth, who said that "in order to leave our successors any options" for ABM systems, the United States should not tie its hands with ASAT limitations.

Michael May

"A high-powered laser system would be detectable."

But others question the Pentagon's need for an ASAT program. For example, Sayre Stevens, a former CIA analyst and current Defense Science Board member who also serves as vice president for strategic intelligence at the Systems Planning Corporation, says "I don't know exactly why it is that we're so anxious to build an ASAT system. I can't see that we're all that helpless. I also don't think we need it as much as we need some other things, such as a better space surveillance system so we really know what's going on." Albert Wheelon, a former CIA analyst who is now a senior vice president at the Hughes Aircraft Corporation, agrees. "I think it's a good idea and to everyone's net advantage to keep mines and torpedoes and lasers and other weapons out of space," he says.

Administration officials publicly insist the door on ASAT arms control is still ajar, and that several options for a limited agreement remain under consideration. One idea is a ban on tests of ASAT's aimed at high-altitude satellites, which are needed for early warning and communications in the event of an all-out war. Sidney Graybeal, a former SALT II negotiator and CIA analyst who is now vice president of the Center for Strategic Policy at Systems Planning Corporation, says that he particularly likes this idea. "The United States has such an overwhelming interest in space assets that a limit on advanced ASAT's—weapons capable of interdicting satellites in geosynchronous orbit—through a ban on testing would be in the net U.S. interest," he says. A second option is to prohibit the trailing of one satellite by another in peacetime, and a third idea is simply to prohibit any peacetime interference with a satellite's operation.

Although the report characterizes the potential for violation of even these limited agreements as troublesome, ACDA director Adelman remains publicly optimistic that one idea or another will prove worth pursuing. "I myself feel there may be possibilities for real proposals for arms control," he said at a recent hearing before the House Committee on Foreign Affairs, adding that a final decision will perhaps be made within the next 6 months.

Few in Congress believe that this continuing review will amount to much. One of the cochairmen of the interagency task force is Richard Perle, who says flatly that "I haven't seen a suggestion yet that meets the two tests of verifiability and [protection of U.S.] national security." The other cochairman is Henry Cooper, an assistant director of strategic programs at ACDA who until recently helped direct the ASAT program for the Air Force. He also admits to "reservations as to the bans being studied," although he claims to be somewhat more enthusiastic than Perle.

William Durch, a research fellow at the Harvard Center for Science and International affairs who recently directed an extensive study of space arms control options for Reagan's ACDA appointees, says he feels that after "looking at all the variables, it is still in the net U.S. security interest to pursue some sort of limit on antisatellite capabilities." He hopes the Administration will eventually come to the same conclusion.—**R. JEFFREY SMITH**

NAS to Explore Expansion of Programs with Soviets

National Academy of Sciences president Frank Press announced on 1 May that he will lead an Academy delegation to Moscow in June "to explore new modes of interaction between American and Soviet scientific communities."

The Academy's governing council in 1980 responded to Soviet actions on Afghanistan and Poland and the banishing of physicist Andrei Sakharov to Gorki by voting to suspend scientific symposia held under the agreement between the U.S. and Soviet academies of sciences. The interacademy agreement, dating from 1959, lapsed in 1982, and cooperative activities between the two academies have been reduced to a small number of informally arranged exchanges of individual scientists.

Press announced his forthcoming trip during his annual report to Academy members, but he offered no details of proposals that might be made to the Soviets. He said that the initiative was the product of 2 years of discussion within the Academy about relations with the Soviets and that "If there is any message that we have received with great clarity from our membership, it is that in these troubled times it is better that scientists keep talking, raising issues of concern, as well as exploring areas of fruitful cooperation."

In a meeting with reporters, Press deflected repeated questions on whether the new effort marked an end to academy protests on human rights issues. "If you ask if we're going because of a change in the human rights situation, that is not the case," said Press. On the other hand, he said if there is no communication on issues in science and on global problems, progress on these issues or on human rights matters is unlikely.

As for the "new ideas" for contacts to which he alluded, Press said only that there were some "hot fields in science" in which an interplay would help both sides. He also said he hoped it would be possible to "recapture some of the flavor of former years when some of the best scientists were involved."

Press said that the State Depart-

ment was informed after the decision was made to enter discussions with the Soviets, and, as has been the case in the past, the department neither encouraged nor discouraged the effort by the quasi-public organization.

—JOHN WALSH

France Invites U.S. Participation on Breeders

Paris. The French government has formally invited the United States to collaborate in a joint program of research with several other European nations—including Great Britain and West Germany—into the next generation of commercial fast breeder reactors.

The invitation was made last week to U.S. energy secretary Donald P. Hodel during a visit to the United States by the French minister of state for energy Jean Auroux. Auroux also suggested that the United States should substantially increase its collaboration with European research groups in nuclear fusion and in coal research.

France has already been collaborating closely with several European countries, including West Germany, Italy, and Belgium, on the development and construction of its Superphénix fast reactor, the world's first commercial-scale fast breeder which is scheduled to come into operation early next year.

Last autumn, the British government, having decided to abandon its previous isolation in fast breeder research, agreed to joint its European allies in developing the next generation of fast breeders, rather than enter into a long-term research partnership with either the United States or Japan. An agreement envisaging the joint development and construction of three 1300-megawatt reactors—one each in France, Britain, and Germany—was signed in Paris at the beginning of January.

The French government offer to the United States to join the fast breeder "club" has been sweetened by its recent agreement to accept international safeguards on Superphénix, which is being built at Crays-Malville in the Rhône Valley.

The lack of any independent review of measures to prevent the diversion of civilian plutonium to military purposes has recently been a target of criticism, particularly from antinuclear activists in West Germany. These have been concerned that German utilities contributing to the cost of Superphénix might find that they were helping to finance the production of weapons-grade plutonium that was subsequently used to manufacture nuclear warheads for France's military forces (*Science*, 10 December 1982, p. 1095).

Although France is not a signatory of the nonproliferation treaty, it agreed 3 years ago to accept international safeguards, which are conducted under the auspices of the European Atomic Energy Organization, on all its commercial fission reactors. These safeguards have now been extended to Superphénix as well.

—DAVID DICKSON

Academy Roundtable Seeks Better Research Links

The National Academy of Sciences has put together a committee of luminaries to plan a series of efforts to improve communications between universities, government, and industry on science policy issues. Known as the Government-University-Industry Research Roundtable Council, it will be chaired by Dale Corson, president emeritus of Cornell University.

The idea, which has been under consideration in the Academy for several months, is to provide a forum for discussing matters of mutual concern to funders, performers, and users of research. Topics will be selected by the council and they will be thrashed out in arenas such as discussion groups, working groups, and commissioned studies. The process is intended to be more flexible than the Academy's traditional report-generating procedures in dealing with actual or potential conflicts on matters such as information controls, budgetary trends, and indirect costs.

The council's members include the directors of the National Science Foundation, the National Institutes of Health, and the Office of Energy Research; the President's science adviser; the under secretary of defense for research and engineering; the presidents of two universities; top officials from three major corporations; and several university researchers. It will hold its first meeting on 16 May to decide its agenda.—COLIN NORMAN

NASA Asks for Review of Space Science

The National Aeronautics and Space Administration (NASA) has asked the National Academy of Sciences' Space Science Board to undertake a major study of space science goals in the decades following 1995—the era in which NASA hopes to have an operational space station (*Science*, 24 February, p. 793).

"We are *not* being asked to do a space station science study," says board chairman Thomas M. Donahue of the University of Michigan. "It's much broader than that."

The effort will take at least 2 years, he says, starting with a 10-day summer study this August in Woods Hole, Massachusetts. There will be perhaps half-a-dozen task groups of 10 to 12 persons each, covering such areas as space astronomy, planetary science, earth observations, and the magnetosphere. The goal is to completely rethink NASA's space science strategy.

NASA has never asked for anything quite like this, says Donahue. The study will resemble somewhat the Academy's Astronomy Survey Committee reports, which regularly look at the needs of space- and ground-based astronomy over a 10-year span. But the report that NASA wants will leapfrog a decade and then look 20 years beyond that. "I have no illusions whatever about the difficulty of the task," notes Donahue.

The NASA request is in part a response to presidential science adviser George A. Keyworth, II, who has been urging the agency to define its long-range goals in space before it embarks on building its space station. And in part it is an olive branch to the space science community itself, which has tended to oppose the space station, and which remains deeply suspicious that the station may have the same adverse impact on science funding that the space shuttle did.

—M. MITCHELL WALDROP