

ister Sergei Kiriyenko's presidium, or inner circle, to obtain more money for science—despite the fact that he was forced right off to cut science funding by about 40%. At the same time, there is deep concern that the minister, who studied electrical engineering and holds a PhD in economics, will stress applied science at the expense of basic research. Says Eugene Velikhov, president of the I. V. Kurchatov Institute of Atomic Energy, "Bulgak's understanding of the importance of building business opportunities for science is good. But I hope it does not lead to diminished funding for fundamental science."

Others are more pessimistic. Says Roald Sagdeev, a Russian émigré now on the physics faculty at the University of Maryland, College Park, "Bulgak will be a real disaster for basic science. I would expect him to be a yes-man for the government." Some physicists in Russia declined to comment on Bulgak, saying that the topic is "sensitive" or that it's too early to make predictions.

Apathy regarding what the minister may accomplish is also common. Explains George Fursey, who heads the surface physics and electronics center at St. Petersburg State University of Telecommunications and is vice president of the International League for the Protection of Culture, "No science minister can protect science, however strong his wish. This can be done only at the level of the highest leadership of the country." Alferov agrees, and adds that what was interest in Bulgak is due partly to the country's high turnover of politicians—over the past seven years, the average time in office for all ministers has been seven months.

According to a Russian government source, Bulgak plans to adopt the priorities for science and technology that were approved two years ago. In the next few months, the source adds, the science and technology ministry will solicit the science community's views on the program—which includes broad categories such as "basic research," "new materials and chemical production," "information technology and electronics" and "ecology and rational use of nature."

Bulgak also reportedly plans to set up a \$180 million supercomputing initiative to develop algorithms and networking, and he may divert some of his ministry's funds to provide venture capital for new technology-oriented businesses—moves that would jibe with his known interest in tightening ties between science and industry. (Some scientists joke that Bulgak will try to turn the Russian Academy of Sciences into a joint stock company—something he suggested last year

should be done with the Russian Foundation for Basic Research.)

Not surprisingly, Russian scientists urgently want to save their enterprise—"one of the very beautiful diamonds on the necklace of world science," as Alferov calls it. And most

agree that doing so will require state support. But, having seen many promises broken, people are skeptical that money or reforms will be forthcoming. A common attitude is expressed by the Russian proverb, "We'll live. We'll see."

TONI FEDER

Neutrino Experiment's Gallium Remains under Siege

Uncertainty persists over the fate of the 60 tons of gallium held by the Russian-American Gallium Experiment (SAGE) in southern Russia. The Russian government has repeatedly threatened to sell the gallium, which is used to detect low-energy solar neutrinos. Last fall, for example, when the Institute of Nuclear Research, which runs the neutrino observatory, refused the government's demand to hand over 7 tons of gallium for sale, it was slapped with a \$5 million fine, more than ten times the observatory's annual budget. SAGE scientists have also had to fend off attempts by common thieves to steal the gallium, which could fetch about \$400 a kilogram on the world market. Meanwhile, they've continued to press the government to transfer the title to the gallium from the state to the Russian Academy of Sciences. (See PHYSICS TODAY, June 1997, page 73.)

The recurring threats to dismantle SAGE have led to international protests on behalf of the experiment. For example, in a letter last December to then Prime Minister Victor Chernomyrdin, 15 American physicists, in-

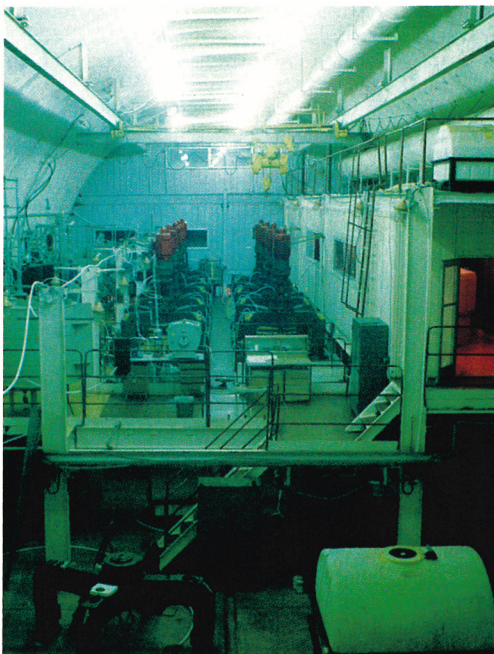
cluding 12 Nobel laureates, urged that the gallium be saved for science: "The investigation of solar neutrinos by SAGE has been one of the most successful research efforts in the past decade, and is now giving very promising indications of new physics. . . . [Reserving the gallium for science] will contribute extensively to world progress in fundamental research and will consolidate the belief in the reliability of Russia as a partner in large joint scientific projects."

"It is astounding," says the Institute for Advanced Study's John Bahcall, who organized the Americans' letter, "that the Russians have been able to do an experiment at the highest level of international achievement under conditions that to westerners look impossible."

SAGE director Vladimir Gavrin believes that the letter and other such efforts led Chernomyrdin to state that "the gallium problem has been solved" when Vice President Al Gore brought up the topic at a meeting of the two leaders this past March. The following week, however, Chernomyrdin and his government were ousted, and the fate of the gallium was plunged back into uncertainty.

Last fall's fine has been dropped for now. And on 15 May, government officials petitioned the new prime minister, Sergei Kiriyenko, and the new science and technology minister, Vladimir Bulgak, to rescind the demand that SAGE hand over the gallium. But the petition, which ignored the issue of title, and thereby tacitly recommended that the gallium re-

SAGE COLLABORATION



SAGE's 60 tons of gallium are held in these eight underground chemical reactors. The incident neutrino flux is measured by extracting radioactive germanium atoms, which are produced when neutrinos interact with gallium.



main under government authority, reportedly was rejected in June, and when PHYSICS TODAY went to press SAGE scientists were still waiting for

ministry that tried to take the gallium." Nor, say Russian and American SAGE scientists, is Bulgak's support for SAGE assured. **TONI FEDER**

word on a new petition. Says Gavrin, "The SAGE gallium problem can be solved finally and completely only if the government decrees that the gallium be transferred to the Russian Academy of Sciences." But convincing Kiriyyenko to do so could be "a big problem," Gavrin says, noting that Kiriyyenko previously headed the fuel and energy ministry, "the very

might recall that Montero is one of the scientists who was denied a visa a year ago, and there was a lot of protest over the State Department's action," says Carlos Handy, a physics professor at Clark Atlanta University. "I don't know if the calls helped, but anyways it worked out."

Montero received his US visa on 26 June, the day before his flight. During his four-week stay, he gave talks at Clark Atlanta and Cornell University and visited a former student who's now at the University of Arkansas.

Copies of *The Effect of Travel Restrictions on Scientific Collaboration between American and Cuban Scientists* are available from the Science and Human Rights Program, AAAS, 1200 New York Avenue NW, Washington, DC 20005; phone 202-326-6790; e-mail shrp@aaas.org.

JEAN KUMAGAI

As US-Cuba Ties Improve, Scientists Ask that Travel Restrictions be Lifted

The easing of political tensions between the US and Cuba following Pope John Paul II's trip to Havana last winter has brought with it greater freedom for American and Cuban scientists pursuing joint collaborations. Nevertheless, policies in both countries continue to restrict scientists' travel, "a freedom fundamental for scientific enterprise," states a report issued last month by the American Association for the Advancement of Science.

A particular concern is the arbitrariness that seems to govern the granting of licenses and visas required for travel between the two countries, notes AAAS's Elisa Muñoz, the author of the report. Among the report's 23 recommendations is that both governments abolish the travel license requirement and cease applying "political criteria" in judging visa applications.

The number of US and Cuban scientists being barred from travel "seems to be declining a little bit," observes Irving Lerch, the American Physical Society's director of international affairs. Physicists have learned, for example, that travel applications containing words like "nuclear" or "quantum" tend to get rejected, he says. "It's a game, and we're becoming more sophisticated at it," adds Lerch. "But if you don't know the ins and outs, your ability to travel can be abridged."

US scientists may rule out traveling to Cuba simply because they don't know how to go about it, Muñoz says. And so, despite having one of the largest science establishments in Latin

America—it is one of only five countries in the region to belong to the International Union of Pure and Applied Physics—Cuba is seldom tapped to host international meetings, out of fear that Americans won't attend. AAAS now plans to set up a clearinghouse for information on US-Cuba scientific exchanges. Among other things, it will assist those whose visa or license requests have been denied.

Of course, travel restrictions are not the only impediments to scientific collaborations. The report also touches on the detrimental effects of the US's longstanding trade embargo on Cuba, and on grosser human rights violations in Cuba, such as the firing of dissident scientists.

Down to the wire

According to the US State Department, 82% of Cuban scientists who applied for visas between January 1997 and March 1998 got them. However, the AAAS report notes, "many [visas] were received too late for the intended travel to take place."

Such late-hour decisions are common fare, confirms Luis Montero Cabrera, a Cuban quantum chemist whose visa rejection last year was vigorously disputed by APS leaders (see PHYSICS TODAY, July 1997, page 55). At the end of June, he was again preparing to visit the US, but several days before his scheduled departure, he had received no word on his visa. Two of his American hosts then called the State Department. "I told them, 'You

University of Texas Opens Materials Institute

The University of Texas at Austin has started up a multidisciplinary research center, the Texas Materials Institute. Among the research areas that TMI is stressing are electronic materials, polymers, structural and mechanical studies of materials, materials chemistry and electrochemical and photochemical processes, says Donald Paul, TMI's director, a chemical engineer who for 17 years headed the university's Center for Polymers, which is now a part of the institute.

A joint undertaking of UT-Austin's Colleges of Engineering and Natural Sciences, TMI draws its 75 or so members from the university's physics, chemistry and engineering faculties. UT-Austin "felt that we really needed to give a big push to materials science because our program has not been highly ranked in the past," says Sanjay Banerjee, an electrical engineer who serves on TMI's steering committee. "We want a more visible and cohesive program." The university will provide the institute, which opened in April, with \$600 000 annually for instruments, technical and administrative personnel and other infrastructure.

TMI is housed in several existing departments at the university and is



DONALD PAUL