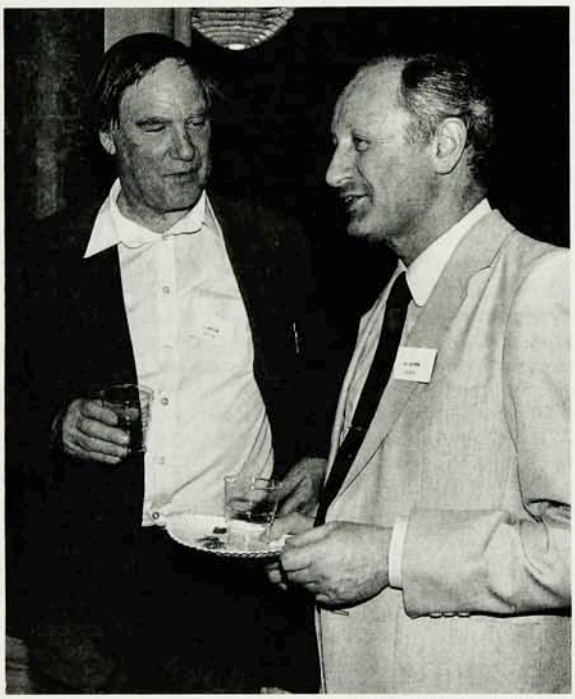
SOVIET PHYSICISTS REESTABLISH PHYSICAL SOCIETY, WITH EMPHASIS ON POLICY

Over the past year, thousands of new organizations have been established in the Soviet Union, and others have been revived after many years of dormancy. One such group is the Physical Society of the Soviet Union. Almost 60 years after Stalin banned the Russian Physical and Chemical Society in 1930, along with almost all other professional societies in the Soviet Union, the Physical Society has been resuscitated. Its first president is Sergei Kapitsa of the Institute of Physical Problems in Moscow—the institute formerly headed by Sergei's father, Peter. Sergei Kapitsa is known for his work on the microtron, synchroton radiation research, arms control and a nationwide television show on science, which he has hosted for many years. The show, which appears twice a month, has had audiences of 10–20 million viewers.

The new Physical Society of the Soviet Union has been endorsed by the Academy of Sciences and the Ministry of Education but is independent of them. It is affiliated with the Union of Scientific and Engineering Societies. The society's first meeting, held at Moscow University on 17–18 November, was attended by 800 scientists from all over the Soviet Union. At the meeting the society's charter was approved and a 50-member council was elected. Kapitsa, who ran against Yuri Kagan, was elected to a three-year term as president. Also elected, as vice president, was Yuri Novozilov of Leningrad University.

Besides the new national society, local physics societies are being formed, based on large institutions or research centers, or representing physicists from specific republics or large cities; these are intended to be independent of the national society. For example, a Leningrad Physical Society is being formed. A Lithuanian Physical Society has already existed for about 25 years. A Nuclear Physics Society, headed by Evgeny Velikhov, will promote safe nuclear energy.



CHRISTEN HANSEN/NORDITA

Sergei Kapitsa (left), the first president of the newly formed Physical Society of the Soviet Union, chats with Yuri Ossipyan, president-elect of the International Union of Pure and Applied Physics. The photograph was taken two years ago in Copenhagen, at a meeting commemorating the late Lev Landau's eightieth birthday.

Describing the proliferation of new organizations, Kapitsa remarked, "Our country is in a highly excited state now that we've broken away from centralized control." He envisions the new Physical Society of the Soviet Union as emphasizing policy rather than research. Its members will be elected by regional branches or directly by the society's council. The most authoritative body in managing physics in the USSR, Kapitsa notes, is the Department of General Physics and Astronomy of the Soviet Academy of Sciences, whose head is Alexander Prokhorov. This department and the Department of Nuclear Physics, headed by Alexander Skrinsky, together comprise 160 physicists—or one-sixth of the academy's members.

The USSR has over 50 Scientific Councils, composed of scientists from the academy, universities and institutes. The councils, which report to the academy and the Ministry of Technology, carry out advisory functions, produce some publications and organize conferences, seminars and workshops. Kapitsa remarks that it is essential for the newly founded society, its sections and its committees to promote cooperation with these councils, as well as to find its own mode of operation.

The new society has established an education committee, chaired by N. V. Karlov, the rector of the Moscow Physico-Technical Institute. The committee is examining the whole structure of physics teaching, from schools to universities and technical universities. Other committees will be established on publications, students, physics and industry, physics and medicine, and physics and society.

An Association of School Teachers of Physics has been established to serve the 300 000 high school teachers of physics in the Soviet Union; the association is affiliated with the Phys-

ical Society, and membership in the society will be open to teachers who have contributed in an original way to physics teaching. The USSR already has a physics teachers' journal, *Physics at School*, with a circulation of 200 000. For high school students, there is *Kvant*, which popularizes physics and mathematics, and has a circulation of 500 000. An English edition, called *Quantum*, is now being published in the US by the National Science Teachers Association.

Kapitsa says one of the primary missions of the society is to promote basic research and protect it from undue commercialization. He also feels the society should put a high priority on recognition and protection of the professional rights of scientists. These include funding, rights to travel and patent rights. The society will promote international cooperation and exchange of students, especially for graduate work.

The Physical Society plans to publish a bulletin or newsletter and to initiate new publications. For example, some physicists have suggested publishing in English a *Journal of Soviet Physics*, to promote direct communication with foreign colleagues. The society also hopes to promote public understanding of scientific concepts, in part to counteract the increasing power of antiscientific and anti-intellectual activities such as astrology and witchcraft, which have suddenly become fashionable in the Soviet Union.

Kapitsa hopes to promote productive collaboration between individuals and industry. "For many decades," he told us, "due to institutional, economic and other reasons, the influence of the generally high standards of fundamental research on industry was very low, and this has to change." He hopes that the new society, as yet uncorrupted by bureaucracy (which he says has compartmentalized research and development excessively), will open some new possibilities for such interaction. Another of Kapitsa's aspirations for the society is contributing to the conversion of military establishments into industrial establishments. He also envisions the society as giving advice to the public, the new parliament and the broader scientific community on major projects, "cutting across established borders." The society will promote interdisciplinary research in energy, ecology, economics and global problems.

The Russian Physical and Chemical Society was founded 100 years ago by Dmitri Mendeleev and lasted until Stalin disbanded it. In 1937 the Mendeleev Chemical Society was founded; it now has a budget of 12 million rubles per year. When the physicists tried to revive their own society in 1946, Kapitsa says that Stalin told them they should mind their business—namely bombs. Another attempt was made in 1971, but the society was never formed.

—GLORIA B. LUBKIN

AIP REPORT DESCRIBES WHO TAKES—AND WHO DOES NOT TAKE—SCIENCE

By the year 2000, American students should be "first in the world in math and science achievement," President George Bush told Congress in his 31 January State of the Union address. US governors echoed the President's optimistic goal in their collaborative report issued a month later.

The nation's leaders have picked a pretty tough row to hoe, according to a new report on the state of US high school math and science education prepared by the American Institute of Physics. Entitled "Who Takes Science?" the report points out that most American students aren't exposed to a rigorous math and science curriculum, despite reforms in graduation requirements, and that only a small percentage of students benefit from the present system.

The report underscores one of the most widely recognized problems in science education: the underrepresentation of females and minorities. For example, 25% of male students took a physics course in high school, while only 13% of females did so. The percentages of males and females who took calculus were 10% and 6%, respectively. And among male and female students who scored equally well on math aptitude tests, the proportions of boys who took physics exceeded the proportions of girls by as much as 20-percentage points. "There appear to be unique barriers keeping females out of physics classes, and these barriers are social rather than aptitude," the report concludes.

The AIP report is based largely on data the US Department of Education's National Center for Education Statistics gathered in 1980 for its "High School and Beyond" study. The study surveyed over 28 000 high school seniors and tested them in reading, math and vocabulary; the same individuals were also queried about their work and education in 1982, 1984 and 1986.

To prepare "Who Takes Science?" AIP's Education and Employment Statistics Division analyzed the 1980 data pertaining to math and science coursework. Though the data is ten years old, the results are still relevant to today's school system, because they "serve as an important benchmark against which recent changes can be judged," the report says. "While a number of important changes have occurred in the education system since 1980, not all of the changes have been positive and most of them have not had a profound effect," the report concludes.

For example, since the 1980 data were collected, state regulations governing the minimum years of science and math required for graduation from high school have increased and become more strict. In 1980 most states had few specific requirements: Fifteen states had no graduation requirements at all, and another 22 required only one year each of mathematics and science. By 1985, 36 states had passed laws requiring two or more years each of math and science to get a high school diploma. Even so, the newer standards are unlikely to increase enrollment in upper level courses because students often fulfill the requirements by taking remedial, introductory or business classes, the report concludes. And, according to a 1987 report released by the Research Triangle Institute in North Carolina, the proportion of high schools that offer upper level math and science courses has changed little since 1980.

Overall, less than one-fifth of the students in the high school class of 1980 took physics, only one-third took chemistry, and most took neither physics nor chemistry. Enrollment in advanced math courses was similarly low. Among black and Hispanic high schoolers, 15% and 12%, respectively, took a physics course. By contrast, 27% of Asian students and 19% of white students took physics.

The report also reveals that students in certain regions of the US fare far worse than their peers from other parts of the country in terms of performance on aptitude tests and the amount of science and math studied. For example, among students attending high schools in the Central Southern states (Alabama, Mississippi, Kentucky, Tennessee, Texas, Louisiana, Oklahoma and Arkansas) less than 20% took two years of science,