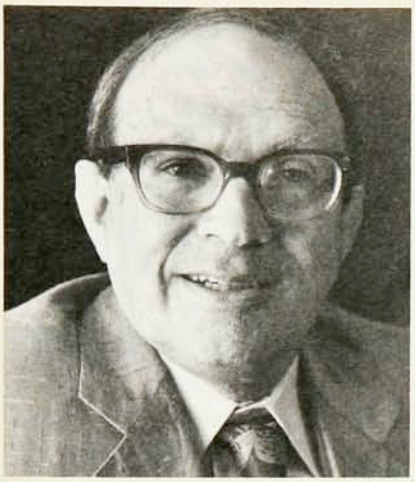

NE'EMAN

functions, but not the education functions, of this commission will also come under the new ministry. As part of current plans to encourage the growth of science-based industries, Ne'eman said that initially his ministry is concentrating on the electronics industry, but later plans to develop the computer software field and to explore possibilities in the biological sciences.

Ne'eman told us that because of his appointment as Minister of Science and Development, he was unable to receive the Wigner Medal during the 11th Group Theory Conference held last August in Istanbul (see page 85). Although he was scheduled to speak and to be awarded the Medal during the conference, once his appointment was announced Turkey denied visas to all Israeli scientists planning to attend and refused to let Ne'eman accept the award by proxy, he said. By agreeing not to attend the conference himself, Ne'eman said that he was able to obtain visas for the other Israelis, but not in time to enable some scientists (who had refused to attend in protest over the denial of visas to Israelis) to attend themselves.

Ne'eman was trained in engineering and physics, receiving a degree in mechanical engineering from the Technion in 1946, and obtaining his PhD in physics from Imperial College, London, in 1961. Since 1962 he has been affiliated with Tel Aviv University, where he has served as head of the physics department since 1963 and as a professor of physics since 1965. He was president of the University 1971 to 1975. He has also been active in the military, serving in the Israel Defense Forces from 1948, retiring as a colonel in 1960. From 1952 to 1955 he was Israel's Defense Planner, a job that entails preparing strategic plans for use in the event of a future war. The plans Ne'eman made during these years became important during the Six Day War. He also served as director of the Israeli Atomic Energy Commission laboratories from 1961 to 1963 and has been a member of the commission since then. As a physicist he is perhaps best known for his work in elementary-particle theory. He is currently interested in supergravity and astrophysics. —JC

NSF gives aid to poorly funded states

Scientists in five of the US states that receive the smallest amounts of Federal support for science are gaining recognition for the advances they are making in their fields; they are also beginning to receive nationally competitive grants. At the same time, both popular and governmental interest in science in their states has grown.

The scientists are recipients of a small-scale but remarkably effective NSF program to boost promising researchers and their research environments into the mainstream. The Experimental Program to Stimulate Competitive Research (EPSCOR) is now in the third year of its five-year grants to scientists in Arkansas, Maine, Montana, South Carolina and West Virginia. The program will cost NSF $13 million over five years.

Careful planning. EPSCOR was planned so that every step of its process would promote its overall goals: to stimulate research communities; to increase state governments' commitments to science and promote industrial involvement and public concern with science; to establish ties between scientists in the funded states and those doing front-line research elsewhere; and at the same time to boost the efforts of promising scientists whose work could, with a little help, become nationally competitive.

In each of the five states that is receiving money and in two others that competed for the grants, NSF started a committee of scientists prominent in the state by appointing a handful of committee members who then chose the remainder. NSF used this indirect selection procedure to ensure that the committees would be responsive to state priorities and that their programs would be more attractive to local industry.

With NSF grants of $125 000 in each state, the committees assessed what barriers militated against effective research and devised funding strategies to overcome the barriers as they solicited proposals for grants. The grant proposals were subjected to extensive review by out-of-state scientists of national stature, some of whom also visited the states. By this means channels were made from formerly isolated scientists to the mainstream. At the same time, scientists in the EPSCOR states benefited from reviewers' recommendations. The proposals the committees approved were subject to the constraint that grants would go only to those fields eligible for NSF money. In addition they were individually reviewed at NSF. Twenty out of 88 projects were eliminated. At the conclusion of the NSF review, two of the seven competing states were eliminated, a condition of the program from the beginning.

To ensure state commitments and to maximize the chances that the programs would outlive the five-year grants, EPSCOR required that the states share the costs in increasing percentages each year; in most cases, 10% the first year, 50% the fifth. Cost-sharing money has usually come from the state universities that house the departments receiving funds. In some cases, funding priorities had to be shifted within the universities. In other cases, state legislatures provided the money by increasing university budgets. In some states, some private money was raised from local industries. Such opportunities were scarce: Montana, with no headquarters of large national corporations and little opportunity to find corporate funds, has perhaps the extreme case of a problem common to the five states.

States' programs. Owing to the autonomy enjoyed by state EPSCOR committees, the programs have been organized differently in individual states. In Montana, where the program is called MONTS (Montanans on a New Track for Science), it has generated so much support that it is known widely to nonscientists, according to program director Gary Strobel, a plant pathologist. There grants were made to individuals. Out of 115 proposals initially received by the state committee (more proposals than the NSF had received from the state over the previous five years), 28 were funded. The physicists who have received MONTS grants are in the physics department at Montana State University: Richard Robiscoe is investigating parity violations in hydrogen nuclei; George Tuthill is working in ferromagnetism; John Hermanson is doing metallic surface theory; John E. Drumheller, studying electron spin resonance, has already left the MONTS program, having received a nationally competitive NSF equipment grant; Richard Smith and Wolfgang Goepel are faculty members receiving MONTS funds and working with Gerald Lapeyre (a member of the state committee) and James Anderson on surface

physics. MONTS grants provide scientists with equipment, research assistants and faculty release time (which frees them from some teaching responsibilities) and pay for lecturers and consultants.

In Arkansas money went to departments or to collaborations among them to improve the research environment. Experimental physicists receiving EPSCOR funds are members of an extramural team working on laser systems: Gregory Salamo, investigating coherent propagation of short optical pulses, and Rajendra Gupta, doing high-resolution laser spectroscopy. Other team members include biologists and engineers working on aerosol growth and velocimetry. Theoretical physicists receiving EPSCOR grants, used for summer salaries and travel, are Michael Lieber and Fui Tak Chan, investigating electron scattering from atoms, and Peter Milonni, working on theory of chaos in quantum optics.

In West Virginia also the program supports university departments. We learned from project director, physicist William Vehse, that recipients in the physics department of the West Virginia University are Milton McDonnell, whose grant enabled him to buy light-scattering equipment to do work in macromolecular dynamics, and Martin Ferer, who is working on phase transitions.

The committees in Maine (where no physicists received EPSCOR funds) and South Carolina focused on a few areas of research that had the greatest chances of becoming excellent. Within physics in South Carolina, EPSCOR has boosted solid-state research in particular, with the purchase of a superconducting quantum interference device. Physics project director Frank Avignone says significant grant support has gone to Timir Datta, who will use the device; Gary Adams, an experimentalist in intermediate-energy nuclear physics; Fred Myrher, a nuclear theorist hired and searched for with EPSCOR money, who has subsequently received a nationally competitive grant; and Chi Kwan Au, James Knight and Edward Lerner, who are receiving summer support to work with the quantum theorist Yakir Aharonov, who divides his time between the University of South Carolina and Tel Aviv University. The grants will also be used to conduct summer institutes for visiting scientists. Horacio Farach and Charles Poole Jr are receiving support to do electron paramagnetic resonance experiments, and Ronald D. Edge has been supplied with equipment to investigate scattering of ions from surfaces.

EPSCOR achievements. "EPSCOR is so far a highly successful enterprise," according to Donald Langenberg, until recently deputy director of NSF. Jack Talmadge and Joseph Danek, its organizers at NSF, report that out of 183 participants in 68 projects receiving EPSCOR support, 61 have received nationally competitive grants. This success occurs with the program only half finished. All those we spoke to were enthusiastic about EPSCOR, commending it for being well conceived and well organized. In addition to the time, staff and equipment it is providing, the program has less tangible consequences, such as public support for science and increases in prestige and visibility of those receiving funding. These in turn are bringing new sources of support, better-qualified graduate students and, of course, advances in research.

The program is also offering a lesson on how to manage science to scientists in the five states. David Drew, a sociologist of science from the Claremont Graduate School (Claremont, California) conducted an NSF study, "Excellence and Equity in Science," that used data from the first phase of EPSCOR. He reports that what has given the EPSCOR programs in some states special viability are qualities of leadership and management. EPSCOR programs have been most successful where leadership has been continuous and where leaders have been bench scientists. He points out also that to be successful, physicists need to "develop networks, visibility and ability to communicate their ideas."

The only problem anyone sees with EPSCOR is that it will end with the close of fiscal year 1984. Although the National Science Board did approve its expansion to five more states in a second phase, that expansion is lost. In 1981 the Reagan administration cut the entire program out of the NSF budget along with other programs that were not funding established researchers doing front-line research in physical science. Congress restored EPSCOR, with the concession that the program would only honor commitments it had already made. —DG

the physics community

1 high-school class → 8 PhDs + 2 Nobels in physics

The class of 1950, Bronx High School of Science, held its first reunion last June at the Sheraton Centre in New York City. Many classes from this highly selective school can boast about the achievements of their graduates. But the class of 1950 is especially noteworthy because out of 718 graduates at least eight became PhD physicists, including Sheldon Glashow and Steven Weinberg, who shared (with Abdus Salam) the 1979 Nobel prize in physics for their contribution to the theory of the unified weak and electromagnetic interaction between elementary particles.

When one member of the class of 1950, Loraine Cole Spencer, heard about Glashow and Weinberg's Nobel prize, she was inspired to begin organizing their first class reunion. After 2½ years of sleuthing, Spencer and colleagues succeeded in assembling their classmates for an evening of fun and reminiscence; 325 attended, including spouses. As it happened, Weinberg didn't attend because he was at his daughter's graduation at Andover.

New York Councilman Henry Stern, class of 1950, delivered greetings from Mayor Edward Koch, who said, "There has not been such an assemblage of genius under one roof since yesterday, when the current classes of the Bronx High School of Science let out for the weekend." Stern reminisced to Glashow about a conversation the two had in high school. Glashow (then aged 13) said to Stern (then aged 11), "I have reached the age of reason. You have not." Stern then inquired, "When will I? How will I be able to tell?" Glashow replied, "*I* will know."

The list of PhD physicists in the class includes:

Gerald Feinberg, theorist working in elementary particles and field theory, physics professor and chairman of the physics department, Columbia University

WEINBERG GLASHOW