

Georgia Tech.

Other talks at the meeting dealt with policy issues. Funding is a big issue in the US, of course, and one that has daily beset William Happer, director of the office of energy research at the Department of Energy. Happer spoke about some of the tough choices that have to be made about various items in the science budget. Happer feels that pork-barrel projects seriously hurt the department's efforts to put money into the best projects, and so does a perception on the part of some members of Congress that scientists have been given *carte blanche* for too long.

But the problems of science in the US don't approach those in the former Soviet Union. Roald Sagdeev of the University of Maryland, College Park, and the Space Research Institute in Moscow described the tremendous economic upheaval in Russia and its impact on scientists and engineers. About half of the world's engineers are in the FSU, so the magnitude of the problem, he remarked, is comparable to finding new employment for all the lawyers in the US. Sagdeev acknowledged that science will have to shrink in the FSU but asserted that the best work should be supported.

Frontiers of physics

Four talks dealt with physics frontiers. Emmanuel Desurvire (Columbia) spoke about erbium-doped fiber amplifiers and their impact on lightwave communications. These amplifiers, which are pumped by laser diode chips, will replace electronic repeaters on transoceanic fiber optic routes by 1995. The erbium amplifiers have a bandwidth in the terahertz range and enable the transmission of signals at rates of tens of gigabits per second across the ocean. Soliton transmission may soon follow.

Horst Stormer (AT&T Bell Labs) spoke about developments in two-dimensional electron systems. Modulation doping has so greatly increased the mobilities of electrons that they can now travel 100 microns without colliding. These essentially ballistic electrons lend themselves to electron optics; they can be refracted or focused by an electronic lens. Two-dimensional electron systems also exhibit the quantum Hall effect: Experimenters have found lots of cases in which the quantum number is a rational fraction with an odd denominator, but more recently they have also seen various even-denominator quantum numbers.

Moving from small spatial dimensions to large energy dimensions,

Alan Guth (MIT) spoke about the birth of the cosmos. He described the success of the standard theory of the hot Big Bang and the modifications that were required to account for the general uniformity of the cosmic background radiation, the observed nonuniformities and the proximity of the mass density to the critical density separating a universe that retracts and one that expands indefinitely. The picture of the inflationary universe proposed by Guth, by Andrei D. Linde and by Paul Steinhardt and Andreas Albrecht offered an explanation for these features.

In contrast to the electron optics discussed by Stormer, David Pritchard (MIT) spoke about atom optics. In reciting the analogies of photons to atoms, Pritchard said that electromagnetic fields or zone plates can be used as lenses, crystals or evanescent waves as mirrors, and standing light waves as gratings. However, said Pritchard, working with de Broglie waves requires a lot more money and considerably more finesse than dealing with light waves.

Tours of the laboratories

The 600 scientists who work at Hewlett-Packard Laboratories occupy two

buildings in Palo Alto as well as a corporate laboratory in Bristol, England, and a smaller lab in Tokyo. These are multipurpose labs, but their work is generally focused on Hewlett-Packard's main product areas—computers and measuring instruments. Participants at the meeting were offered two tours, each corresponding to one of these two areas of research. At the computer research center, located on Page Mill Road, participants saw demonstrations of such information-related technology as magnetoresistive recording heads, thermal ink jet technology and helical tape storage. The demonstrations included a physician's workstation and a robot used in manufacturing.

The second tour group went to the measurement research center, situated at the laboratory's other Palo Alto facility on Deer Creek Road. The visitors learned about Hewlett-Packard's work on optoelectronic devices and saw the molecular beam epitaxy facility for growing III-V compounds. The tour covered a variety of topics from capillary electrophoresis to a cesium clock to a high-Q superconducting resonator.

—BARBARA GOSS LEVI

WEISSKOPF, SAGDEEV AND CASSIDY HONORED WITH AIP AWARDS

A highlight of the 1992 Corporate Associates Meeting was the presentation of three awards during ceremonies at the Holiday Inn in Palo Alto, California, on 17 and 19 October. Victor Weisskopf received the Compton Award, Roald Z. Sagdeev received the John T. Tate International Award

for distinguished service to the profession of physics, and David C. Cassidy was given the AIP Science Writing Prize to a Scientist.

The certificate presented to Weisskopf with the award cited "his leadership throughout the world in advancing science, in promoting peace and in

Victor Weisskopf



Roald Z. Sagdeev





David Cassidy

seeking solutions to world problems." It praised his roles as director general of CERN from 1961 to 1965 and as founding leader of the High Energy Physics Advisory Panel. "As a teacher and author, Victor Weisskopf encourages and strengthens the finest traditions and deepest values of science," the certificate said.

Weisskopf earned a PhD in physics from the University of Göttingen in 1931. Over the next six years he was a research associate at various institutes in Europe, working under Erwin Schrödinger, Werner Heisenberg, Niels Bohr and Wolfgang Pauli. In 1937 he joined the physics faculty at the University of Rochester. Weisskopf joined the Manhattan Project as deputy head of the theoretical division at Los Alamos in 1943. Three years later he moved to MIT, where he is now an emeritus Institute Professor of Physics.

The Tate Award recognizes a non-US citizen for "distinguished service to the profession of physics." Sagdeev was cited for "his pivotal contributions to the development of the space physics program in the former Soviet Union and his leadership in supporting and advancing broad international cooperation in the study of physical phenomena in space." He was also praised for his leadership in international arms control.

Sagdeev received his undergraduate degree from Moscow State University in 1955 and his doctorate in theoretical physics from the Moscow Institute for Physical Problems in 1960. During the 1960s he was head of the Plasma Theory Laboratory of the Institute of Nuclear Physics in Novosibirsk. In 1971 he joined the Institute of High-Temperature Physics in Moscow, and in 1973 he became director of the Institute of Space

Research in Moscow. In 1990 Sagdeev moved to the University of Maryland, where he is a Distinguished Professor of Physics and director of the East-West Space Science Center.

The science writing prize recognizes distinguished writing in physics or astronomy for the general reader. Cassidy, an associate professor in the natural sciences program at Hofstra University, was chosen for his book *Uncertainty: The Life and Science of Werner Heisenberg*, published by W. H. Freeman and Company (New York, 1991). (See PHYSICS TODAY, June 1992, page 79, for a review of the book.)

Cassidy received a BA in physics from Rutgers University in 1967, an MS in physics from Rutgers in 1970 and a PhD in the history of physics from Purdue University in 1976. He was associate editor of *The Collected Papers of Albert Einstein*, published by Princeton University Press. He is currently studying postwar science in Germany and working on a book on Einstein.

LATEST AIP SURVEY GETS MIXED SIGNALS FROM JOB MARKET

The latest Employment Survey, one of four annual reports produced by the Education and Employment Statistics Division of the American Institute of Physics, registered a complex image from information gathered in the winter and spring of 1991-92. "The current listless economy has caused many recent graduates to explore nontraditional routes in pursuit of their career goals; hence it has become increasingly difficult to present a clear picture of the employment opportunities available to them," Susanne D. Ellis and Patrick J. Mulvey wrote in the opening sentence of the report.

Surveying 1991 recipients of bachelor's, master's and doctoral degrees roughly six months following their graduation, Ellis and Mulvey found some signs of slight improvement. For example, just under two-thirds of those getting PhDs in physics needed three months or more to find a potentially permanent job; the year before, the proportion was 70%. The median monthly salaries for those taking postdocs in 1991 was \$2600, compared to \$2460 in 1990 and \$2400 in 1989. The median monthly salary for those taking full-time, potentially permanent positions was \$3830 in 1991, compared to \$3580 in 1990 and \$3760 in 1989.

Increased job satisfaction seems to have been another positive sign in 1991. Among those who earned PhDs, two-thirds said they were not interested in changing jobs, while the year before, half said they were uninterested in finding new employment.

Nonetheless, negative signs also abounded. Among those who earned bachelor's degrees in 1991, 14% were not employed and were looking for jobs when the survey was conducted, compared to 10% the year before. There was an increase by ten percentage points in the proportion of physics bachelors who had received only one job offer at the time of the survey.

A smaller proportion of the bachelors accepted industrial manufacturing positions—19% in 1991, versus 25% in 1990—which are generally the best-paid jobs available. Moreover, "compared to the previous year, the greatest change was recorded for bachelors who engaged in 'nonphysics professional work.' These graduates accepted positions that require college degrees and not necessarily technical training. . . . Among the 1991 graduates, not only did the proportion of respondents in this category triple, but their median salary declined by 18%."

The median monthly salary obtained by the 1991 bachelors who found jobs was \$2150, compared to \$2220 in 1990 and \$2000 in 1989. The median monthly salary for master's degree recipients in 1991 was \$3120, compared to \$3000 in 1990 and \$2680 in 1989.

The 1991 Employment Survey includes detailed tables showing selected characteristics of degree recipients. Copies of the complete report can be obtained free of charge from the AIP Education & Employment Statistics Division, 335 East 45 Street, New York NY 10017.

IN BRIEF

The American Association of Physicists in Medicine, a member society of the American Institute of Physics, has decided to move its headquarters from New York City to the American Center for Physics in College Park, Maryland (see PHYSICS TODAY, September 1992, page 61). Construction of the center is scheduled to be completed in October 1993. The American Vacuum Society's headquarters staff and the standards secretariat of the Acoustical Society of America will remain in New York City after AIP moves to Maryland. They will relocate to city-subsidized offices in the Wall Street area. ■