

an Southern Observatory and the European Space Agency. ESO's observatory at La Silla in Chile has optical telescopes with mirrors ranging from 100 cm to 3.6 m in diameter and a 15-m submillimeter radiotelescope built with Swedish cooperation; La Silla also houses a 2.2-m optical telescope operated by the Max Planck Institute for Astronomy (PHYSICS TODAY, March, page 89).

Major ESA space astronomy projects include the much-delayed Ulysses mission to Jupiter and the Sun and the Hubble Space Telescope (both with NASA); the Hipparcos astrometric satellite, scheduled for launch next year (PHYSICS TODAY, August 1985, page 62); the Infrared Space Observatory, scheduled for launch in 1993; the Solar and Heliospheric Observatory, scheduled for 1992; and, in the still more distant future, a large x-ray mission (XXM) and a far-infrared submillimeter telescope (FIRST). Germany has contributed important hardware to a number of ESA satellites including COS-B, Exosat and Giotto.

Independently of ESA, Germany has been planning two major missions with NASA: the long-delayed Galileo, which is now to be launched in 1989, still from the Shuttle but not using the flammable Centaur booster, so that its intercept with Jupiter will be even more delayed; and Rosat (Röntgen satellite), to be launched in 1990 from an expendable rocket rather than the shuttle, with the objective of doing surveys in the soft-x-ray region and in the extreme ultraviolet. Rosat will carry the most sensitive imaging x-ray telescope ever built and will be available to users worldwide for individual experiments.

Priority list

Given the importance of international projects to Germany's programs in astrophysics, it is hardly surprising that the country's astronomers justify their requests for new facilities and projects in terms of the need to be able to offer something to potential partners in other countries.

The report's wish list of large projects, each costing more than 40 million marks, starts with two items already on the books: Rosat and the Very Large Telescope, an optical instrument consisting of four 8-m mirrors slated for Chile, which ESO's members agreed to build last December. Next on the list of big projects are a German Big Telescope, described as a minimally segmented optical telescope with a 10-m mirror, and a gravitational wave experiment.

The top priority on the list of

medium-sized projects (ones costing between 10 and 40 million marks) is guaranteed access for astrophysicists to a supercomputer. Next come a second radiotelescope of up to 50 m for the Eifel observatory, so that the current instrument can be freed up for very-long-baseline interferometry using satellites; a part in an internationally planned Large Earth-Based Solar Telescope; and a long-baseline (perhaps as long as 1 km) optical interferometer.

Recommended smaller projects of less than 10 million marks are, in order of priority: supplementary equipment for interferometry at millimeter wavelengths; expansion of IRAM's three-telescope interferometer on the Plateau de Bure to six telescopes; participation in a European VLBI data evaluation center; development of neutrino detectors; further development of an air shower facility that the University of Kiel is building at La Palma in Spain; and a German cosmic ray experiment for NASA's proposed space station.

Outlook

In a letter to DFG President Hubert Markl, Minister of Science and Technology Heinz Riesenhuber has taken the following positions on the recommendations contained in "Denkschrift Astronomie":

▷ BMFT sees no reason to modify the existing structure of funding: Astronomy, as a basic research field, will continue to rely largely on DFG for funds, competing with the other basic research disciplines; the state governments will remain responsible for university-based institutes and the federal government for the Max Planck institutes; and BMFT will support space projects, ESO and IRAM.

▷ BMFT supports the creation of a computation network and specifically will fund the creation and maintenance of software for processing data yielded by space-based astronomy, and it presumes that the state governments will make matching investments at the institutes; it considers its German Research Network a suitable vehicle for a computation network.

▷ Because of the government's commitment to VLT, there is no chance in the foreseeable future of BMFT's finding money for the German Big Telescope project.

Riesenhuber noted that private foundations (such as Volkswagen and Krupp) have contributed substantially to investments in large astronomical instruments. DFG, technically a nongovernmental agency, distributes federal and state research funds on the basis of recommendations from independent peer review panels.

Astronomy and physics

The analysis and recommendations in "Denkschrift Astronomie" are predicated on an awareness of the growing convergence of astronomy and physics. "To the extent our knowledge of the cosmos and its processes grows," the report says at the top of the first page, "so grows the significance of physics in astronomy. Thus ever greater regions of astronomy are turning into astrophysics. From this point of view the cosmos represents a giant, nature-given laboratory. We have the impression that here, in natural form, it will be possible to delineate the limits of what is possible and doable."

Because of this convergence, the authors of the report regard a specialized university education in astronomy, sharply separate from physics, as undesirable.

The report notes that elective courses in astronomy are available in secondary schools throughout the Federal Republic and that clearing-houses for model experiments in astronomy and other instructional materials are becoming increasingly widespread.

Roughly 100 astronomy associations, with around 10 000 members, operate some 80 observatories and publish more than 50 newsletters in West Germany, making the Federal Republic Europe's leader in amateur astronomy, the report claims. "Ignoring the astrology phenomenon," the report says with satisfaction, "no other branch of science has so broad and active a popular base."

—WILLIAM SWEET

CRAVEN WILL SUCCEED BERMAN AS ACA PRESIDENT IN 1989

Bryan M. Craven, chairman of the crystallography department at the University of Pittsburgh, is the new vice president of the American Crystallographic Association, and Vivian

Cody, senior research scientist at the Medical Foundation of Buffalo, has been elected to serve a three-year term as ACA secretary. Craven will become president of the association



Helen M. Berman

next year, succeeding Helen M. Berman of the Institute for Cancer Research at the Fox Chase Cancer Center in Philadelphia.

Berman received a BA in chemistry from Barnard College in 1964 and a PhD in crystallography from the University of Pittsburgh in 1967. She was a National Institutes of Health postdoctoral trainee at the University of Pittsburgh from 1967 to 1969, when she joined the staff of the Fox Chase Cancer Center. Berman became director of the Research Computer Facilities at Fox Chase in 1982 and currently is a senior member of the cancer institute's staff. She is an adjunct professor of chemistry at the University of Pennsylvania.

Berman's research involves the use of x-ray crystallography to study structural changes in nucleic acids under different conditions, and she has contributed to the understanding of flexibility and diversity in DNA conformation. Her research has applications to the study of carcinogenesis and mutagenesis and to drug design.

Craven received a BSc in 1953, an MSc in 1954 and a PhD in chemistry in 1958 from the University of Auckland in New Zealand. He was a research associate and instructor at the University of Pittsburgh from 1957 to 1959 and assistant and associate professor from 1959 to 1971. He became a professor of crystallography at the University of Pittsburgh in 1971. Craven has served two terms as chairman of the department: from 1974 to 1977 and from 1985 to the present.

Craven's research interests include structures of complex lipids, Patterson methods, electrostatic properties of molecules as measured by x-ray and neutron diffraction, and thermal



Bryan M. Craven

vibration analysis. He is a coeditor of *Acta Crystallographica*.

Cody earned a BS at the University of Michigan in 1965 and a PhD in chemistry at the University of Cincinnati in 1969. She was a teaching assistant at the University of Cincinnati from 1965 to 1967 and an NSF fellow from 1967 to 1969. She was a fellow at the University of Missouri in St. Louis from 1969 to 1970, when she joined the Medical Foundation of Buffalo as an endocrinology trainee. Subsequently she became a research scientist in crystallography at the foundation, an associate research scientist and, finally, a senior research scientist.

Cody uses x-ray diffraction techniques, molecular mechanics calculations and computer graphics analysis to study the relationships between structure and activity in hormone-drug-receptor interactions.

WOLFF HEADS NATIONAL OPTICAL OBSERVATORIES

The Association of Universities for Research in Astronomy, a consortium of 20 US universities, has appointed Sidney Wolff to be the director of the National Optical Astronomy Observatories. The observatories include the Kitt Peak National Observatory in Arizona, Cerro Tololo Inter-American Observatory in Chile, the National Solar Observatory—which has facilities at Kitt Peak and Sacramento Peak, New Mexico—and the Advanced Development Program, which is charged with the design of 8-meter and 15-meter telescopes.

Wolff received her BA from Carleton College in 1962 and her PhD in

astronomy from the University of California, Berkeley, in 1966. She was a research astronomer at Lick Observatory of the University of California, Santa Cruz, in 1967. From 1967 to 1976 she was associated with the Institute of Astronomy at the University of Hawaii, advancing from assistant astronomer to full astronomer and associate director. She has been director of Kitt Peak National Observatory since 1984. Wolff's research has been in stellar spectroscopy.

IN BRIEF

A report is available on a conference, "The Future of Science in China and the Third World," which was held in Beijing in mid-September under the sponsorship of the Third World Academy of Sciences. Conference proceedings are being prepared. The report can be obtained from the Office of the Executive Secretary, International Centre for Theoretical Physics, P.O. Box 586, Strada Costiera 11, Miramare, 34100 Trieste, Italy.

A directory of institutions that will be conducting special programs in science, mathematics and engineering for talented pre-college students in summer 1988 and the 1988-89 academic year is available for \$1 from the Science Service, 1719 N Street NW, Washington DC 20036.

The American Geophysical Union has published a trial issue of a new magazine for high-school teachers called *Earth in Space*. The magazine seeks to present geophysical research in a popular form suitable for adaptation to classroom use. AGU also has decided to fund a lecturer program for the annual meeting of the National Science Teachers Association. For sample copies of the new magazine, contact Leslie Meredith, AGU, 2000 Florida Avenue NW, Washington DC 20009.

A catalog of Mexican physics programs and physicists is available from the Sociedad Mexicana de Fisica, AP 70-542 Coyoacan, 04510 Mexico City, Mexico.

The American Mathematical Society has started a new journal, the *Journal of the American Mathematical Society*, to celebrate its centennial year. The first issue appeared in January. Sample copies can be obtained by writing to AMS, Membership and Sales Department, P.O. Box 6248, Providence RI 02940. Specify sample copy order code JAMS/1/1/BNR. ■