

new location, including help with sale and purchase of homes. For AAPT staff, who now are headquartered near the campus of the University of Maryland in College Park, the move to new quarters just two miles away will be a minor inconvenience.

The American Center for Physics will be about a half mile from a new Metro station, which also is expected to be completed by the end of 1993. The Metro will facilitate access to downtown Washington and will make it relatively easy for visitors to reach the center. The new headquarters building will be about 12 miles from downtown Washington, about a half hour by car from Baltimore-Washington International Airport and directly connected by Metro to Washington National Airport.

APS, AAPT and AIP staff

Finalization of the relocation plans ends a chapter that had been quite controversial among leaders of AIP's member societies for nearly a decade and opens a new chapter in the history of physics organizations in the US. "The decision to relocate to the Washington area was very important and was debated at length," says Werthamer. "It will have a substantial impact on physics and on the APS for a long time to come."

Virtually the whole Manhattan and Woodbury staff of APS will move to Maryland, though its journals staff will remain at Ridge, Long Island. APS's public affairs office already has moved into new quarters at the National Press Building near the White House.

AAPT will move its entire staff to the new headquarters, and it hopes to convert part of its current building, which it bought several years ago with the help of a gift from the Homer L. Dodge family, into a national demonstration center for physics teaching. The Dodge name probably will move with AAPT headquarters to the new location but may also remain attached to the teaching demonstration center.

Most of AIP's divisions now based in New York City, including accounting, career planning and placement, history, *PHYSICS TODAY*, public information, and statistics, will move to Maryland. Advertising, books, exhibits and marketing will stay somewhere in New York. AIP's education division, its senior education fellow, staff for the Society of Physics Students, the magazine-journal *Computers in Physics* and the AIP development office—which until recently were located at the American Geophysical Union's building on Florida

Avenue or in a nearby building—will be based in Maryland.

Altogether about 150–160 AIP and APS staff positions will move to the new headquarters.

Special design features

The American Center for Physics will contain roughly 120 000 square feet of floor space, enough to house its three initial member societies, with room for one or two more organizations. Up to 480 000 square feet of building space can be accommodated on the site, so that ample room exists for the founding organizations to expand or for a variety of other organizations to join the center.

The approach to the center will be an elliptical drive of eccentricity 0.54, and the building itself will be located at the far end of the major axis (the northern end). AIP's Niels Bohr Library, a featured element in the design by the firm Skidmore, Owings & Merrill, will occupy three floors immediately above the entrance.

The first-floor exterior walls and the two ends of the building will be covered with rough limestone, while the exterior of the upper floors will be made of glass and white-painted metal. The upper-floor windows will be floor-to-ceiling and will provide pan-

oramic views of the wooded setting.

Representatives of AIP, APS and AAPT subunits have worked closely with the architects on the design of the sections where they will be located. AIP will occupy the second and third floors, which will have burgundy decor; APS, with green carpets and trim, will be on the fourth floor; and AAPT, on the fifth floor, will have a blue motif.

The first floor will have conference rooms, a day-care facility, a fitness center, a lunch room and a central domed lounge, which is intended as a kind of "living room" for staff and visitors. A wide corridor or "gallery" serving the various first-floor spaces will have a rosy marble floor and wood walls, painted white, with natural cherry wood trim.

The steering committee of the American Center for Physics worked closely with the architects and with consulting engineers to ensure that the building design is energy-efficient to the maximum practical extent. Every effort is being made to preserve trees on the site, and exterior lighting has been designed to minimize light pollution. There will be footpaths in the adjoining woods, and enclosed gardens will flank the building's north entrance.

IBM, SIEMENS AND TOSHIBA TO DEVELOP 256-MEGABIT CHIP

The announcement in mid-summer that IBM, Siemens and Toshiba would jointly develop a 256-megabit chip was surprising on several scores.

Toshiba, known for a hard-nosed corporate culture that expects a quick return on research investment, was not necessarily the company that industry analysts would have expected to ally with an American arch-rival in a risky long-term R&D program.

Siemens, though already working with IBM on development of the 64-megabit dynamic random access chip, had announced just months before that it would not, after all, build a new factory in Germany to produce the DRAMs. Seen especially in the context of Europe's troubled Joint European Submicron Silicon Initiative, Siemens's commitment to the chip business seemed shaky at best.

And IBM itself, having just gone through a period of intense self-scrutiny and corporate reorganization, would not necessarily have been considered capable of winning support from leading competitors abroad for an ambitious R&D program. In

fact, given IBM's newly decentralized structure, which seeks to make research more directly answerable to business units and which encourages units to compete among themselves, it is no longer taken for granted that IBM will continue to manufacture all the chips it uses itself.

Above all, at a time of growing economic nationalism in relations between the US, Europe and Japan, the IBM-Siemens-Toshiba agreement represents a striking transnationalism. And it is quite a coup for IBM that most of the R&D will be concentrated at its facility in East Fishkill, New York.

"One of the most important things about this agreement is that it keeps an important technology in the US," IBM's Paul Horn told *PHYSICS TODAY*. Horn, who used to be in charge of research in the physical sciences at IBM's T. J. Watson Research Center in Yorktown Heights, now is head of the silicon laboratory.

Horn says research on the 256-megabit chip will be located mainly at the Fishkill facility, and IBM's team

initially will number "in the tens," but the total number of people working on the project will eventually reach more than 100, split among the three partners. In addition about 500 IBM staff members are needed to run the Fishkill facility.

According to Hans Queisser, a director of the Max Planck Institute for Solid-State Research in Stuttgart, who serves as an adviser to Siemens, the German company currently has about 60 people working with IBM on the 64-megabit DRAM, and Toshiba presumably will match this number.

Contrary to earlier expectations, manufacture of the 256-megabit DRAM will *not* involve x-ray lithography, at least initially. Horn and Queisser agree that researchers will concentrate on a number of new optical lithography techniques involving ultraviolet light and phase-shifted masks (see *PHYSICS TODAY*, October 1991, page 17). They expect such techniques to yield a resolution as fine as .25 micron, the scale needed for the 256-megabit chip.

Queisser, who had just visited the Fishkill facility when he dropped in on *PHYSICS TODAY* in early August, expressed considerable admiration for the manufacturing and test equipment that IBM has installed—some of which was developed with the aid of Sematech, the chip-equipment-testing consortium that IBM has strongly supported. Manufacture of 64-megabit memories at Fishkill, and possibly fabrication of the 256-megabit chip as well, will depend especially heavily on a new lithography system called Mirascan II, a scanning deep-ultraviolet optical tool developed by Silicon Valley Group Lithography Systems Inc, partly with the help of Sematech.

Separately from the agreement to develop the most advanced DRAM, several major international alliances have been forged this year concerning the development of flash memories—chips that retain information after power is turned off, giving them the potential to replace hard drives. These have included agreements between Sharp and Intel, IBM and Toshiba, and Advanced Micro Devices and Fujitsu.

In flash memories information is stored by electrons charging a floating or insulated gate either by tunneling through or being excited above the insulating barrier. Static random access memories, which depend mainly on transistors linked in bistable (flip-flop) circuits, retain information as long as power is running but not—in contrast to flash memories—when power is off. In DRAMs the key components are capacitors, and conse-

quently their contents must be replenished periodically while power is on by means of supplementary circuits.

On average, Queisser explained, SRAMs require about four times as much "real estate per bit" as DRAMs, and for a given number of bits per chip, the development of the SRAM

usually lags a generation behind the DRAM. As a result, following the research and production logic pioneered by Intel, the usual procedure is to convert a DRAM production facility, once it has achieved high yields and completed a full production cycle, for production of the follow-on SRAM.

—WILLIAM SWEET

G7 SUMMIT YIELDS LITTLE IN WAY OF AID FOR STATES OF FORMER USSR

Munich (München): in the tourist's lexicon, one of the world's most pleasant and interesting cities. In the physicist's reference frame, home of the world-famous Deutsches Museum and, after Paris, the greatest concentration of scientific talent in Europe. In the framework of politics and international affairs, a name that connotes Hitler's Beer Hall Putsch, Chamberlain's appeasement policy and the 1972 Olympics tragedy.

Seen in the context of international politics, the summit meeting of the seven leading industrial nations that took place in Munich in early July was not quite the disaster that the name and place might seem to imply. But the anticlimactic results certainly were not something to write home about—and few correspondents did. The major agenda item was to be aid for the states of the former Soviet Union, and the yield was near zero.

In addition to firming up a \$24-billion stabilization program for the FSU, the G7 leaders had been expected to discuss establishment of an international foundation for FSU science with an initial endowment of about \$100 million (*PHYSICS TODAY*, June, page 67), and several newspapers had confidently predicted they also would adopt a multibillion-dollar program to enhance the safety of nuclear reactors throughout the former Eastern Bloc. In fact none of that occurred.

Despite a cameo appearance by Russian President Boris Yeltsin at a summit dinner, leaders left Munich less confident than when they arrived as to whether the International Monetary Fund would end up disbursing the monies authorized. This is because Yeltsin's radical economic reforms have run into snags amid growing fear that Russia may be headed for total economic catastrophe.

The proposal for an international foundation that would make peer-reviewed grants to FSU scientists in response to proposals (the so-called Okun-Voloshin proposal), failed to

win the support of the US and Japan. Instead a smaller grants-making organization is being established under the aegis of the European Commission with support mainly from France and Germany. Its funding initially will be at a level of \$4–\$5 million per year, and it is being managed, at least provisionally, by Paolo Fasella, the head of the EC's noninformation technology directorate.

CERN's Robert Klapisch, who has worked diligently on the Rubbia proposal for close to a year, says that he believes the foundation still will "snowball somehow" into a much more substantial program. But it remains to be seen whether he is right.

As for the program to upgrade Soviet-made reactors, it too ran up against the opposition of the US and Japan. "The American President said that this problem would not be solved by creating a new bureaucracy," a spokesman for the German government said during the summit. The US and Japan argued at Munich that the problem of reactor safety should be addressed by means of bilateral projects. As a result, a program to upgrade nuclear power plants in the states of the FSU and East Central Europe also has been shunted to the European Commission in Brussels, where it is in the hands of Laurens-Jan Brinkhorst, the EC director general for the environment, nuclear safety and civil protection.

The International Atomic Energy Agency has an ongoing program of inspection and evaluation of the Soviet-built RBMK (Chernobyl-type) and VVER (pressurized-water) reactors. (The Russian acronym RBMK stands for high-power channel-type reactor, VVER for water-water power reactor.) But a spokesman for the IAEA, expressing his own opinion, has complained that the FSU states already are suffering a confusion of advisers. What the FSU needs, he suggested, is a single, coherent program of international aid.

—WILLIAM SWEET