

Europe to mandate introduction of D2-MAC, a transitional HDTV technology Thomson has developed with Philips and Bosch under the aegis of EUREKA for satellite transmission of wide-format images (PHYSICS TODAY, March 1990, page 67). But in Britain, which has the only well developed market for satellite-transmitted television in Europe, broadcasters and the government have resisted conversion to D2-MAC and its presumed successor, HD-MAC.

At a meeting on HDTV held in Brussels literally on the eve of the CEA-TCE merger, France had to settle on an agreement that requires only new satellite transmitters to use D2-MAC, starting only in 1995; and while both the European Parliament and the European Commission remain committed to HD-MAC as the ultimate standard for European television, the question of specific European financing for HDTV development was left to further negotiation.

France's aspirations have been equally thwarted in semiconductors. Here the hope was to build SGS-Thomson into one of the world's top-ranking manufacturers, working closely with Philips and Siemens in the framework of JESSI, the EUREKA organization created to develop sub-micron silicon chip technology, especially for applications in HDTV. But at the beginning of 1990 Siemens entered into a strategic alliance with

IBM to develop dynamic random access memories, replicating a similar and rather successful alliance that Siemens had forged with Toshiba. And then in late 1990 Philips withdrew from work on static random access memories, leaving the three-legged stool of JESSI badly disabled.

The Siemens-IBM agreement was not without benefits for France, in that the two companies have announced their intention of adding a \$700-million chip factory to the IBM complex at Corbeil-Essonnes, southeast of Paris, to manufacture 16 megabit DRAMs. And Philips too remains involved with France: Last November Philips and SGS-Thomson agreed to build a new research facility in Crolles, France, to develop logic chips, especially for HDTV.

But the fact remains that the major developments in semiconductors during the last two years, like the major developments in television, have left France on the sidelines. Siemens, not SGS-Thomson, has emerged as the major player in Europe, and Siemens's main priorities are the strategic alliance with IBM and a similar alliance with Toshiba, which covers reduced instruction set chips. In December, Siemens and IBM surprised the industry with the announcement that they had developed production prototypes for 64-megabit DRAMs—currently the cutting edge in circuit integration. —WILLIAM SWEET

was to produce chips as a means of improving manufacturing technology. But increasingly the emphasis has been on testing equipment and materials produced by US suppliers, who are represented by an organization known as Semi/Sematech. In addition, a greater share of the Sematech budget now takes the form of contracts to small companies to boost their R&D efforts. In 1988 external R&D contracts accounted for 53% of the budget, compared to 20% in 1989.

In addition to its R&D contracts, Sematech has funded research programs at 11 universities, known as Sematech Centers of Excellence, at about \$10 million annually. It also conducts joint projects with Sandia and Oak Ridge national laboratories. The Sandia project involves development of a software program that predicts system and component reliability. At Oak Ridge researchers are working on high-density plasma sources, which would yield higher etching rates and less damage during wafer processing.

But Sematech's strategy has a few weak spots, critics say. For one, in awarding contracts and testing equipment, the consortium must select which manufacturer and which machine to back; in so doing it may be giving the chosen few an unfair advantage. And even if Sematech is successful in helping a company improve its machine, nothing prevents that company from then selling to Japanese or European chip makers.

Mixed reviews

Sematech's performance to date has received widely different ratings from both insiders and outsiders. A review committee sponsored by Congress, the Advisory Council on Federal Participation in Sematech, gave the consortium generally good marks in a report released last year. The report characterized Sematech's main contributions to US industry as "indirect" and said benefits were "likely to come from the continued operation of commercially vigorous US-based manufacturing firms ready and able to exploit emerging technologies." The report also credited Sematech with improving communication between US chip makers and suppliers.

Although the council's report recommended that Congress continue Sematech's funding, it also questioned whether Sematech's goals rely too heavily on current-generation lithography techniques and pointed out that its move toward more external R&D activities has "exposed a division of interest among the consortium's participants."

SEMATECH PROPOSES NEW FIVE-YEAR RESEARCH PLAN

Sematech, the US semiconductor research consortium based in Austin, Texas, has proposed a new research plan, hoping to sustain the financial backing it now receives from the Federal government and its own members for an additional five years.

Founded in 1987, the consortium currently receives \$100 million per year—about half its budget—from the Department of Defense and another \$100 million from its 14 member companies. About 60% of its 380-person technical staff is drawn from member companies. Sematech's initial five-year charter expires at the end of this fiscal year (30 September), and next year the consortium is expected to receive \$80 million in Federal support—a 20% drop from fiscal 1992. But William J. Spencer, the president and CEO of Sematech, has said the consortium will remain in business even if the Federal government withdraws or decreases support.

The new five-year plan calls for the development of American-made equipment capable of handling 0.25-micron line widths by the end of 1994 and 0.18-micron technology by the end of 1996. The original five-year plan had a stated goal of a 0.35-micron capability, which the consortium says is close to being achieved.

Another major thrust of the new plan is to develop computer software to design and simulate chip-manufacturing equipment, so that the time between introduction of new generations of technology can be reduced by 25%. The software program would extend Sematech's current work on computer-aided chip design, with the intention of eventually modeling entire factories prior to construction.

Even before the new plan was announced, Sematech's research program had begun to evolve away from its original charter. As initially conceived the Sematech factory in Austin

This division of interest is reflected in the withdrawals of two Sematech members, LSI Logic of Milpitas, California, and Micron Technology of Boise, Idaho. A third company, Harris Corporation of Melbourne, Florida, has also given the required two-years' notice to withdraw and would be eligible to do so in January 1993. LSI Logic and Micron, who were the consortium's smallest members, were said to disagree with the general direction of Sematech's work and felt they were not getting a large enough return on their investment. (Members pay annual dues equal to 1% of their revenues.) Larger members such as Hewlett-Packard, IBM and Advanced Micro Devices, on the other hand, are reported to be well

satisfied with the consortium's strategy and accomplishments thus far.

Spencer has said that the departures will not affect the consortium's survival and that Sematech is now negotiating with three other companies that might become new members.

Other activities

In a separate development, Sematech signed an agreement of cooperation last September with JESSI, its European equivalent. The two parties agreed in principle to cooperate on projects involving shared activities, such as standards and quality management, and those involving complementary activities, such as modeling, packaging and materials.

—JEAN KUMAGAI

IRAN RESCUES TRIESTE PHYSICS CENTER FROM FINANCIAL CRISIS

Because of a peculiar legislative glitch in Italy, which provides about 90% of the budget for the International Centre for Theoretical Physics in Trieste, ICTP found itself facing a severe financial crisis as 1991 drew to a close. While the Italian government was preparing legislation to put funding for ICTP onto a longer-term basis, the center found itself without cash to cover a transitional period of about six months. As a result, by the end of October letters of dismissal were prepared for its 140 staff members, and the center issued urgent appeals to the Italian government and the world at large.

Those appeals were answered in mid-November with an offer from the minister of culture and higher education of Iran, Mostafa Moin, who offered to provide an interest-free loan of \$3 million, to be repaid as soon as funds from Italy once again became available. A message accompanying the loan offer said it was made "in appreciation of all the services Professor Abdus Salam [the founder and director of ICTP] has done for science, and in light of his commitment to the advancement of science in developing countries."

Concurrently with the Iranian offer, the Italian Foreign Ministry provided about \$2.5 million as an extraordinary contribution, and a regional government announced its willingness to guarantee a bank loan of about \$3.5 million. Meeting in early December, the board of governors of the International Atomic Energy Agency in Vienna, which is responsible for management of ICTP, approved the loan offer from Iran.

ICTP currently supports about 80 foreign scientists working at Italian universities and in Italian laboratories, as well as 50 postdocs at the center itself. It sponsors 40 workshops and conferences each year, involving about 4000 participants from all over the world. In the years since its founding in 1964, according to the center, more than 45 000 scientists from virtually every country in the world have worked and studied at ICTP. Roughly 60% of the visitors come from developing countries, and they spend on average about a month and a half at the center.

While the main emphasis at the center has always been physical and mathematical theory, it also sponsors some experimental programs, including the program for training and research in Italian universities, which is geared mainly to experimenters. The center operates three laboratories: a Microprocessor Laboratory, with the Italian National Institute for Nuclear Physics and the United Nations University, Tokyo; and, with the International Centre for Science and High Technology in Trieste, a High-Temperature Superconductivity Experimental Laboratory and a Laboratory of Lasers and Optical Fibers.

Italy's Ministry of Foreign Affairs traditionally has provided ICTP with about \$17 million per year, budgeted in four-year cycles; the IAEA has provided a little more than \$1 million a year and UNESCO about \$0.4 million. A new plan adopted by Italy's Parliament just before Christmas guarantees funding through to 1998, at the same level of \$17 million per year.

MOUNT GRAHAM OBSERVATORY WINS LEGAL ROUND

In mid-December a US court of appeals in San Francisco ruled that the University of Arizona may proceed with construction of the Mount Graham Observatory, despite concerns voiced by environmentalists over the fate of the red squirrel, an endangered species. The court found unanimously that legislation adopted by Congress in 1988 exempts the first phase of the project, in which three telescopes are to be installed, from further environmental review.

The appeals court remanded two points still in dispute back to a district court, which in the meantime also has found in the university's favor. While those points may be appealed again, university officials are beginning to sound confident that they will prevail and that construction will proceed without further hitches.

The University of Arizona still is seeking a new cosponsor or cosponsors for the Columbus Telescope Project, one of the three telescopes slated for Mount Graham. While it has received expressions of interest from several institutions, a firm commitment has yet to materialize.

Before Ohio State's withdrawal from the Columbus project, the plan was to start work on the Columbus mirror soon after a 6.5-meter mirror is cast this winter for the conversion of the Multiple Mirror Telescope to a single-mirror telescope. The MMT, located on Mount Hopkins in Arizona, is run by the Smithsonian Institution and the University of Arizona.

KAON FACTORY WINS FEDERAL, PROVINCIAL FUNDING IN CANADA

Canada's KAON project, a large K-meson factory that is to be built at the Tri-University Meson Facility near Vancouver, has made a big stride toward obtaining full funding, but it still is some way from being altogether out of the woods.

The plan for KAON is to upgrade the existing 500-MeV TRIUMF cyclotron to deliver a 100-microamp beam of 30-GeV protons, which in turn would yield intense secondary beams of K mesons, antiprotons, other hadrons and neutrinos (see PHYSICS TODAY, May 1989, page 17). Hence the acronym KAON.

Last fall TRIUMF received a commitment of \$236 million (in Canadian