Political Currents in EUV Technology When the venture was launched last year, it seemed exciting. Intel Corp, the world's largest producer of microprocessors, and three Department of Energy (DOE) laboratories would explore how to use extreme ultraviolet (EUV) lithography in manufacturing semiconductors and would share the new technology with companies in the US, Japan and Europe (PHYSICS TODAY, October, 1997, page 85). The technology, invented at Sandia National Laboratories as part of their "Star Wars" research, takes advantage of the short wavelength of EUV light to etch integrated circuit lines less than 0.1 micron wide. Intel and its US partners, Advanced Micro Devices and Motorola, claim that microprocessors made along those lines will be 100 times faster and store 1000 times more information than is currently possible.

To step up the technology, the companies signed a cooperative R&D agreement (CRADA) with three national labs—Sandia, Lawrence Livermore and Lawrence Berkeley. But, while the enterprise had the blessings of the Defense Advanced Research Projects Agency, the US Semiconductor Industry Association and Sematech, it angered some makers of semiconductor equipment, who took their grievances to members of Congress. At issue was whether the research would benefit US microchip engineering firms or their rivals abroad.

Intel and its commercial partners had lined up Japan's Nikon Corp, which supplies about 50% of the world market for lithography equipment, and ASML of The Netherlands to join the EUV lithography partnership and to become the main companies in developing manufacturing equipment based on the technology. The protests came from such US firms as Ultratech Stepper of San Jose, California, and Integrated Solutions Inc, based in Austin, Texas. In Congress, Joe Barton, the feisty Texas Republican who chairs the House Oversight and Investigations Subcommittee, stepped up first to defend the US firms. Michigan's John Dingell, senior Democrat on the House Commerce Committee, and California's George E. Brown Jr, senior Democrat on the House Science Committee, quickly followed. In a letter to Energy Secretary Federico Peña, they posed 23 questions about the deal. The response from Victor Reis, assistant secretary of energy for defense programs, assured the congressmen that foreign researchers would not have access to DOE laboratories and that the consortium, given the name EUV LLC, would not violate any national security mission. It turns out that DOE approved of the $250 million that Intel and its partners promised to pour into EUV LLC as a way to save jobs at Sandia and at Lawrence Livermore, now that the end of the cold war has reduced the need for nuclear weapons research.

But Silicon Valley entrepreneur Arthur W. Zafiropoulo was dissatisfied. He objected to non-American companies using technology devised at the expense of US taxpayers. Once the controversy erupted, Nikon chose to pull out rather than get embroiled in a messy political squabble. For its part, Intel, which produces the logic chips in more than 80% of all personal computers and is defending itself against an antitrust action by the Federal Trade Commission, has licensed the technology to Silicon Valley Group, a small supplier of projection steppers, located in San Jose, California, and, on 6 May, it said it will also license Zafiropoulo's company, Ultratech Stepper.

Without Nikon or Canon, a Japanese company that controls 29% of the global microprocessor equipment market, the heat is off Intel and DOE in making sure that US companies have a major stake in the new technology. ASML, with only 10% of the market, remains within EUV LLC, but doesn't cause any handwringing.

Even so, the political skirmishes may not be over. The departments of Commerce and Defense have expressed concern to DOE about the potential commercial and military impacts of exporting laser and optics technology that are essential in the EUV projection stepper system.

Brookhaven Reactor Decision Delayed Prospects for restarting the troubled High Flux Beam Reactor at Brookhaven National Laboratory have taken a turn for the worse. On 28 May, the Department of Energy informed local governments that the decision on whether to reopen the reactor has been delayed from next December to May 1999 and that the US Nuclear Regulatory Commission (NRC) has agreed to conduct "a comprehensive safety and compliance review" of the reactor. The main reason for postponing the decision is that DOE has received almost 600 comments on the environmental impact statement being prepared for the reactor and needs more time to weigh them all.

A month after the 30-year-old HFBR was shut down for routine maintenance in December 1996, the laboratory found elevated levels of tritium in groundwater adjacent to the reactor site and put the reactor's restart on hold. DOE subsequently identified a fuel rod storage pool as the source of the tritium leak. Tests of the groundwater by the US Environmental Protection Agency and New York's Suffolk County Department of Health Services found that the small amount of contamination posed no danger to lab employees or the public.

Nonetheless, Senator Alfonse D'Amato and Representative Michael Forbes, both New York Republicans who are campaigning for reelection in November, have opposed reopening the HFBR, which has been an important source of neutrons for research in biology, chemistry, physics and advanced materials. Meanwhile, fuel rods have been removed from the storage pool and shipped to DOE's Savannah River site for reprocessing, the pool has been emptied to eliminate the source of the tritium plume and relined with steel, and water from the leading edge of the plume is being pumped to a recharge basin to prevent it from reaching beyond the lab boundary on Long Island.

University of Utah Drops Cold Fusion It took nine years, but the University of Utah has now ended its patent claims for "cold fusion." The decision represents "the end of a chapter" for the university, which has spent about $500 000 pursuing the controversial technology, according to Richard Koehn, its vice president for research.

"After nearly a decade of work on this subject by respectable people, there has been no progress in duplicating the original claims," said Koehn. "For that reason, we decided it was not appropriate to spend any more public funds on this."

The university had been bound by its original agreements with two chemists, Stanley Pons and Martin Fleischmann, to seek patent approval in the US and Europe for the simple electrochemical technique they claimed could produce nuclear fusion of hydrogen or deuterium atoms in an ordinary glass flask at room temperature (PHYSICS TODAY, December 1989, page 43). ENECO, a company in Salt Lake City that acquired the rights to both the patent and the technology, relinquished its license from the university last year after a fruitless and expensive attempt to win patent approval in the US. The university tried to relicense the patent rights, but found no takers, then offered the license to Pons and Fleischmann, who declined. "At that point," said Koehn, "we were finally free to step away from it all."

Even so, there remain some true believers. "The abandonment of a patent has no bearing on the science," Fleischmann is reported to have told *Nature*. "The research can proceed in a more positive way without a patent claim." **IRWIN GOODWIN**