Darpa, NIST to end funding for U.S. maskless lithography

U.S. companies got an unwelcome surprise this week at a maskless lithography workshop: The U.S. government will no longer fund new and emerging technology in the United States.

At the maskless meeting here this week, which was sponsored by International Sematech (Austin, Texas), U.S. vendors were told behind the scenes that the National Institute of Standards and Technology (NIST) will not fund any new U.S. projects for maskless lithography in 2005.

In another blow for the U.S. industry, the Defense Advanced Research Projects Agency (Darpa) reportedly plans to cease funding for maskless lithography in the United States in 2006. Maskless lithography promises to give chip makers some relief from the soaring costs of photomasks, which are expected to carry price tags of $3 million at the 65-nm node and $6 million at 45-nm. Maskless is ideal for foundries and ASIC houses, because they make many chips in small volumes.

The cutbacks were viewed by some as a setback for the embryonic U.S. maskless lithography-tool industry, especially for startups that rely on funding from Darpa and NIST to get their projects off the ground. In sharp contrast, maskless lithography efforts in Europe and Japan appear to be united, funded and moving full speed ahead.

"We were very disappointed," said Purabi Mazumdar, program manager within the Advanced Technology Program (ATP) at NIST, in an interview at the meeting. "In 2005, we don't have any money for new (maskless lithography) projects. ATP didn't get any new money."
Mazumdar cited budget cuts and other factors for NIST's surprising move to end funding for maskless. NIST will continue to fund current and ongoing contracts in the arena, she said.

The NIST representative, along with several tool developers, also confirmed that Darpa will end funding for U.S. maskless projects in 2006. <P> Agency officials could not be reached for comment. Some believe that Darpa's entire lithography program is endangered, given the recent retirement of the agency's long-time program director, David Patterson. Patterson was the champion for Darpa's efforts in lithography, analysts said.
In any case, one U.S. startup in maskless lithography was given the bad news by both NIST and Darpa at the Maskless Meeting. "I'm frustrated," said one executive in the industry. "I see the efforts in Europe and Japan. These guys are united and funded."

The problem with the United States "is that there are no leaders to champion the U.S. industry," the executive said. <P> "It will take a champion" to propel maskless in the United States, agreed Hans Pfeiffer, a consultant with HCP (Monterey, Calif.) and the former lithography guru at IBM Corp. "I see strong support in Europe," he said. "With all the expertise in the United States, there should be more coordinated efforts."

Sematech does not appear to be the champion, however. "Sematech is representing their member companies," he said. "What you see here is a group of risky projects" which may or may not be of interest to Sematech's members. Walter Trybula, a senior fellow at Sematech, said only that "I have not had any interaction with" NIST and Darpa. <P> This is not to say there is little innovation in the U.S. In the United States, Applied Materials, Lumarray, Multibeam, Novelx and others are working on the technology.

In Europe, however, semiconductor manufacturing equipment companies ASML Holding NV, Leica Microsystems AG and Mapper Lithography NV, together with the three leading European chip makers -- Infineon Technologies AG, Philips Semiconductors, and STMicroelectronics NV -- have recently formed a European advisory board on maskless lithography under the auspices of Europe's Medea+ program.

MEDEA+ is cooperative R&D effort in microelectronics within the pan-European Eureka framework. The objective of the board, known as EAB-ML2, has been created to provide guidance to various European initiatives and research programs on maskless lithography.

In Japan, there are several efforts as well. Canon Inc. and Hitachi Ltd. are co-developing a multielectron-beam tool under a government program. Advantest, E-Beam and Hitachi are also separately developing maskless lithography tools.