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IIT-Mandi develops next generation IC chips

By PTI | 6 Jun, 2013, 10:04PM IST

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SHIMLA: IIT-Mandi has developed a new technology to deal with key problems causing deficiencies in manufacturing next generation IC chips.

IIT-Mandi develops next generation IC chips

The project to the design and develop photo-resists using extreme ultraviolet lithography (EUVL) was taken up by a team of scientists under Professor Kenneth Gonsalves.

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Professor Gonsalves is working with an interdisciplinary team that includes Dr Subrata Ghosh and Dr Pradeep Parmeswaran of the School of Basic Sciences and Dr Satinder Sharma of the School of Computing and Electrical Engineering.

"In today's world, semiconductor chips play a vital role in our daily lives as they are at the core of modern computing and telecommunications and are also key to development of computer controlled and operated machinery," an IIT release said.

As semiconductor-device manufacturers compete to offer high performing, low heat generating and cost effective devices, there is an ongoing drive to reduce the IC feature size to 22 nm (nanometres), which boosts speed and lowers cost, the release said.

Extreme ultra-violet lithography (EUVL) is one of the more promising next-generation tools for achieving smaller feature sizes and is also cost effective, has higher unit throughput and simplified working," Dr Subrata Ghosh explained.

The project at IIT Mandi involves the design and development of photo-resists that are directly sensitive to photons and do not require chemical amplification with the problems that it introduces. The new resist design uses polymers that are prepared from monomers containing sulfonium groups, the release added.

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IIT-Mandi comes up with cost-effective IC chips

EXPRESS NEWS SERVICE

SHIMLA, JUNE 6

IN A signification breakthrough, the Indian Institute of Technology (IIT) Mandi has now developed a technology for next generation cost-effective IC chips.

A team headed by visiting professor Kenneth Gonsalves has come up with the semiconductor chips that play a vital role in modern computing and telecommunications technologies. It also helps in the working of computer operated machin-

ery and mechatronics, which combines mechanical, electrical, control and computer engineering techniques.

The project involved design and development of photoresists, which are directly sensitive to photons and do not require chemical amplification with the problems that it introduces. The new resist design uses polymers that are prepared from monomers containing sulfonium groups, which is highly sensitive to UV photons.

The ultimate goal of Gonsalves and his team is to develop photoresists of sizes 16 nm (nanometres) to 10 nm, significantly below the currently used 22 nm.

The research team has successfully developed and tested resists that show resolution at 20 nm under electron beam exposure. These prototypes will now be refined and tested for imaging at the 16 nm and even 10 nm under EUV exposure. The team is also developing and testing other novel hybrid organic-inorganic photoresists.

"Reducing the size of features boosts speed and lowers cost as more transistors can be placed on a single chip. Extreme ultra-violet lithography (EUVL) is one of the more promising next generation tools for achieving smaller feature sizes," a spokesman of the IIT Mandi said.

It is also cost effective, has higher unit throughput and simplified working. It is expected that EUVL will become a major technology for the next generation of IC fabrication and manufacturing.