New research could trigger revolution in computer electronics manufacturing

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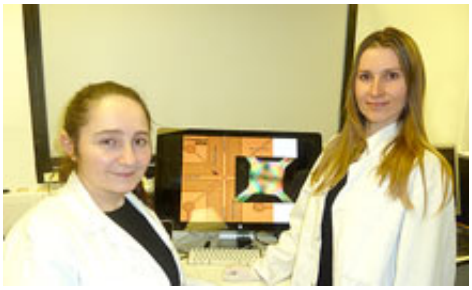

Professor Monica Craciun and Dr Anna Baldycheva from Exeter's Centre for Graphene Science. Credit: University of Exeter

A pioneering new technique to produce cutting-edge, versatile microchips could revolutionize the speed, efficiency and capability of the next generation of computers.

Researchers from the University of Exeter have developed an innovative new method to engineer computer chips more easily and cheaper than conventional methods.

The discovery could revolutionise the production of optoelectronic materials – or devices that produce, detect and control light – which are vital to the next generation of renewable energy, security and defence technologies, the researchers said.

The research is published in the respected journal *Scientific Reports*.

Dr Anna Baldycheva, from Exeter's Centre for Graphene Science and author of the paper said:"This breakthrough will hopefully lead to a revolution in the development of vital new materials for computer electronics. The work provides a solid platform for the development of novel next-generation optoelectronic devices. Additionally, the materials and methods used are extremely promising for a wide range of further potential applications beyond the current devices."

The innovative new research focused on developing a versatile, multi-functional technology to significantly enhance future computing capabilities.

The team used microfluidics technology, which uses a series of minuscule channels in order to control the flow and direction of tiny amounts of fluid. For this research, the fluid contains graphene oxide flakes,that are mixed together in the channels, to construct the chips.

While the graphene oxide flakes are two-dimensional- consisting of length and width only- the research team used a new sophisticated light-based system to drive the assembly of the three-dimensional chip structures.

Crucially, the research team have analysed their methodology to not only confirm the technique is successful, but also to provide a blueprint for others to use to help manufacture the chips.

Professor Monica Craciun, co-author of the paper and Associate Professor of Nanoscience at Exeter added: We are very excited about the potential of this breakthrough and look forward to seeing where it can take the optoelectronics industry in the future "

More information: Benjamin T. Hogan et al. Dynamic in-situ sensing of fluid-dispersed 2D materials integrated on microfluidic Si chip, *Scientific Reports* (2017). DOI: 10.1038/srep42120

Provided by University of Exeter

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