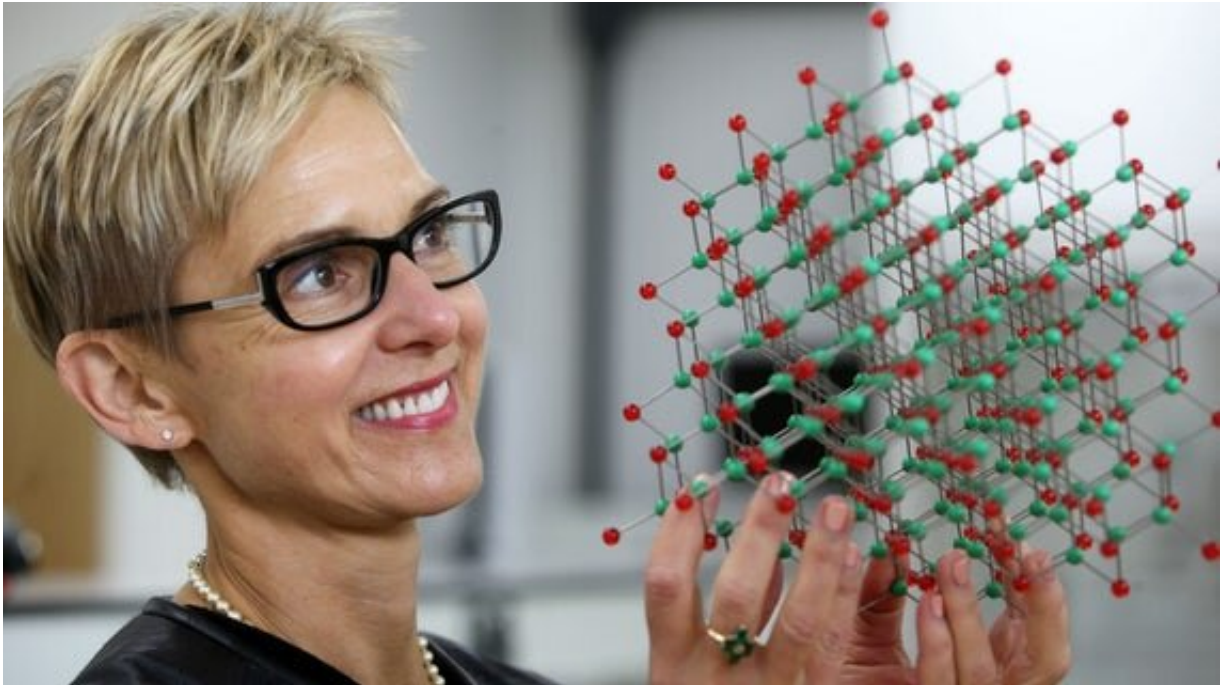


Experts develop nanolasers on silicon

May 29 2019



Credit: Cardiff University

Researchers at Cardiff University have shown tiny light-emitting nanolasers less than a tenth of the size of the width of a human hair can be integrated into silicon chip design.

The [photonic](#) band-edge lasers can operate at superfast speeds and have the potential to help the global electronics industry deliver a range of new applications—from optical computing to remote sensing and heat

seeking,

Professor Diana Huffaker is Scientific Director of Cardiff University's Institute for Compound Semiconductors, based at Cardiff University's School of Physics and Astronomy.

"This is the first demonstration that shows how photonic band-edge lasers can be integrated directly on patterned silicon-on-insulator platforms," said Professor Huffaker.

"Silicon is the most widely used material in semiconductor industries. However, it has been difficult to integrate compact light sources on this material. Our research breaks through this barrier by developing extremely small lasers integrated on silicon platforms, applicable to various [silicon](#)-based electronic, optoelectronic, and photonic platforms."

The paper, "Room-Temperature InGaAs Nanowire Array Band-Edge Lasers on Patterned Silicon-on-Insulator Platforms," has been published in *Physica Status Solidi—RRL*.

Professor Huffaker is ICS) and Sêr Cymru Chair in Advanced Engineering and Materials.

Her research expertise lies in nanoscale epitaxy, fabrication and optoelectronic devices. Active projects include 3-D nanolasers, advanced photodetectors and photovoltaics.

Dr. Wyn Meredith, Director of the Compound Semiconductor Centre, a Joint Venture between IQE Plc and Cardiff University, said: "This research will have long-term implications in the rapidly expanding field of photonics, with a particular emphasis on driving commoditisation of high volume, high specification optical components for mass market

communications and sensing applications."

More information: Hyunseok Kim et al. Room-Temperature InGaAs Nanowire Array Band-Edge Lasers on Patterned Silicon-on-Insulator Platforms, *Physica Status Solidi (RRL) - Rapid Research Letters* (2018). DOI: [10.1002/pssr.201800489](https://doi.org/10.1002/pssr.201800489)

Provided by Cardiff University

Citation: Experts develop nanolasers on silicon (2019, May 29) retrieved 24 April 2024 from <https://phys.org/news/2019-05-experts-nanolasers-silicon.html>

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