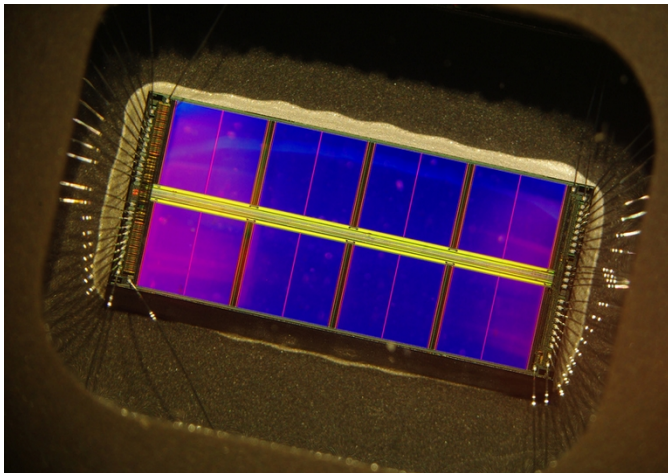


Glass Brightens Way for Computers of the Future

Written by Marco Attard
13 November 2014

Researchers at the University of Surrey, University of Cambridge and the University of Southampton discover a glass material found in CDs and DVDs might be key to the super-fast all-optical (or photonic) computers of the future.



The computers we know and love use electrons to transfer information and process application. Meanwhile a lot of networking (including the internet) use transfer information using light, as carried in optical fibbers. As a result, information might travel at the speed of light, but slows down once it reaches a computer, as it has to be converted into electrical signals.

"The challenge is to find a single material that can effectively use and control light to carry information around a computer," project leader Dr Richard Curry says. "Much like how the web uses light to deliver information, we want to use light to both deliver and process computer data."

Such a material might be amorphous chalcogenides, which is the basis of current optical storage. Using a technique called "ion doping," the researchers created a glass material able to use light to bring together different computing functions into one component. Or an all-optical system, in other words.

"This has eluded researchers for decades, but now we have now shown how a widely used glass can be manipulated to conduct negative electrons, as well as positive charges, creating what are known as "pn-junction" devices," Curry says. "This should enable the material to act as a light source, a light guide and a light detector – something that can carry and interpret optical information. In doing so, this could transform the computers of tomorrow, allowing them to

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effectively process information at much faster speeds.”

The researchers predict the optical material will find use in computers within 10 years. In the nearer future the glass finds use in CRAM (aka phase-change memory), a storage technology potentially many times faster than either HDDs or flash memory.

Go [New Research Lights the Way to Super-Fast Computers](#)

Go [N-Type Chalcogenides by Ion Implantation \(Nature Communications\)](#)