

# CIKC CAMBRIDGE INNOVATION AND KNOWLEDGE CENTRE

Advanced Manufacturing Technologies for Photonics and Electronics

## Graphene spin-out founded

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Cambridge Graphene Platform (CGP) will commercialise graphene inks based on research work at Cambridge University, including a recent CIKC small grant. The new company has developed a scalable method of ink production from graphene and other layered nanomaterials. These nanomaterials have many interesting properties that make them promising for the printed and large area electronics industry. Layered, or two-dimensional (2D), materials can be conductive, semiconductive or insulating, depending on their types.

The variety of layered materials available for processing is leading to the development of a library of inks with a range of electronic and optoelectronic properties, according to Dr Tawfique Hasan, who is one of CGP's co-founders. The ink technology being developed by CGP can be printed or coated by various methods on flexible substrates.

Hasan and his colleagues, which include Felice Torrisi, at the [Cambridge Graphene Centre](#) within the university, formulated the ink by liquid-phase exfoliation of graphite in water and organic solvents. The dispersion contains one atom thick sheets of graphene. The ink does not require harsh chemical or thermal processing and has the potential to be manufactured at low cost in commercial quantities, because the precursor material is graphite, which is cheap. Compared with other approaches the process developed by Cambridge University does not use readily-soluble graphene oxide flakes. Graphene oxide fails to recover its full pristine electrical characteristics even when oxygen is removed.

In order to develop printed samples the research team invested in an inkjet printer with funding support from the [Cambridge Integrated Knowledge Centre](#) (CIKC) within the university. UK printed electronics company [Novalia](#) has worked with the team to validate the inks using commercial printing methods, resulting in a novel demonstrator.

CGP will also work with partners and customers on identifying commercial applications. These include replacing indium tin oxide (ITO) in touchscreen applications in consumer electronics, disposable diagnostic devices for the biomedical industry and 'sprayable' electromagnetic shielding. Hasan, a Royal Academy of Engineering Research Fellow, says: 'Graphene and other layered material inks, with their extraordinary properties, open exciting possibilities in the printable, functional ink industry. CGP is aiming to lead the way forward in the development and production of these materials.'

Full details of the article are from the latest issue of [+Plastic Electronics Magazine](#)

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