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19 June, 2016 - 22:38 By Tony Quested

Cambridge Graphene Centre catalysing a UK valuechain



The growing importance of the Cambridge Graphene Centre in catalysing the development of a value chain for this unique material has been highlighted in Charles Cotton's new book 'The Cambridge Phenomenon: Global Impact.'

Graphene is a form of carbon consisting of planar sheets just one atom thick. It is a naturally occurring material that has many unique properties. One of the many applications is in printed and flexible electronics, for example graphene ink, developed in Cambridge, allows printing of conductive tracks on plastic and other flexible surfaces.

Professor Andrea Ferrari (*pictured*), director of the Cambridge Graphene Centre, says: "Graphene is making its way from the lab to the factory floor, creating jobs and growth for Cambridge and the UK. Cambridge is very well-placed in the network of UK, European and global initiatives targeting the development of new products and devices based on graphene and related materials."

Researchers at the Cambridge Graphene Centre include Professor Clare Grey of the Department of Chemistry. Professor Grey is incorporating graphene and related materials into next-generation batteries and has recently demonstrated a breakthrough in lithium air batteries.

Another key player is Professor Mete Atature from the Department of Physics, who is using layered materials for research in quantum optics. One potential application is a computer network based on quantum mechanics, which would be far more secure and

more powerful than classical computers.

A number of new companies have been established, for example Cambridge Nanosystems, co-founded by Dr Krzysztof Koziol from the Department of Materials Science & Metallurgy and recent Cambridge graduate Catharina Paulkner.

The company produces high volume amounts of graphene for industrial applications and has recently established a partnership with a major auto manufacturer.

FlexEnable, which produces flexible displays and other electronic components, hails the role of the centre. CEO Chuck Milligan says: "The Cambridge Graphene Centre is a great addition to the Cambridge technology and academic cluster. We are proud to be a partner of the centre and support its activities.

"Graphene and graphene-like materials are very relevant to flexible electronics for displays and sensors, and we are passionate about taking technology from labs to the factory floor.

"Our unique manufacturing processes for flexible electronics, together with the exponential growth expected in the flexible display and Internet of Things sensor markets, provide enormous opportunity for this exciting class of materials."

Chris Jones of Novalia says the company wouldn't be the same elsewhere: "Being based in Cambridge offers a fantastic advantage; we belong to a network of companies working in related research areas.

"The close geography allows for a cross-pollination of ideas and capabilities. In particular our relationship with the Graphene Centre has given us access to world class facilities, equipment as well as academic expertise and a pragmatic input into research.

"We have worked on a number of collaborations with them to produce graphene based versions of our drum kit poster, the transparent piano and our joint developments of graphene based flexographic ink systems."

Among other local companies with an interest in graphene technologies are the R & D arm of global telecommunications firm Nokia, printed electronics pioneer Novalia, Cambridge Nanosystems, Cambridge Graphene, and AIXTRON which specialises in the large-scale production of graphene for a variety of applications.

Underpinning this commercial R & D effort is public and private investment via the Graphene Flagship, a pan-European consortium of industrial partners and associate members.

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