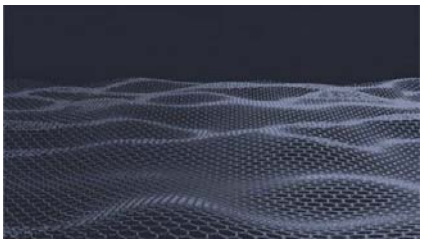
Research News

Pilot project for €1 billion research programme on graphene launched

Cambridge is to lead the technology roadmap towards a €1 billion European program to conduct research on graphene - a versatile substance, stronger than diamond, which researchers say could trigger a “smart and sustainable carbon revolution.”



The ambitious and large-scale initiative aims to achieve new breakthroughs both in terms of technological innovation using graphene, and the economic exploitation of the material.

Graphene is a one-atom-thick sheet of carbon atoms in a honeycomb lattice. Its high electrical conductivity and optical transparency mean that it is ideal for applications like touchscreens, liquid crystal displays, and organic light-emitting diodes. In particular, it is seen as an alternative to indium tin oxide, which is commonly used in liquid crystal displays but is brittle and costly.

Graphene’s mechanical strength and flexibility are also advantageous, as they mean that the material can be fixed to any surface and bent or twisted without becoming damaged.

By understanding graphene’s unique properties, researchers hope to turn this potential in reality, developing the material’s potential uses as an alternative to batteries, lightweight components for cars and planes, and in the fields of spintronics, quantum information processing and communication technology.

> Exploiting the full potential of graphene will have huge impacts on society at large."
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> *—Dr Andrea Ferrari*

“Graphene, a truly European technology, initiated in the UK, is at the crossroad between fundamental research and applications,” Dr Andrea Ferrari, from the Department of Engineering, who will lead the technology roadmap of the consortium, said.

“Exploiting the full potential of graphene will have huge impacts on society at large. We are thrilled that the EU Commission shares our view and believes in our focused and open approach to moving forward, at a time when the international community, from United States to Korea, is moving significant resources to strengthen their know-how and facilitate the roadmap to applications.”

Ground-breaking experiments on graphene, carried out by UK scientists Andre Geim and Konstantin Novoselov, were awarded the 2010 Nobel Prize in Physics. Their work has sparked a scientific explosion, best illustrated by the exponential growth of publications and patents related to graphene.

Huge amounts of human resources and capital are being invested in graphene research and applications in the US, Japan, Korea, Singapore and elsewhere. The first products are expected to enter the market by 2014, according to estimates by Samsung.

The pilot phase of the project started on May 1. This includes Chalmers University of Technology in Sweden, the Universities of Manchester, Lancaster, and Cambridge in the UK, the Catalan Institute of Nanotechnology in Spain, the Italian National Research Council, the European Science Foundation, AMO GmbH, Nokia, and has 4 Nobel Prize winners in the advisory board (Geim, Novoselov, Fert and von Klitzing). Its main task is to pave the way for the full, 10 year, €1 billion flagship programme. The plan for this will be submitted to the European Commission in 2012, with a view to launching in 2013.