



## The Pilot for a visionary research initiative on graphene funded by the European Commission

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A coordination action on graphene has been funded by the European Commission to develop plans for a 10-year, 1 Billion euro Future and Emerging Technology (FET) flagship. This is an ambitious, large-scale visionary research initiative, aiming at a breakthrough for technological innovation and economic exploitation based on graphene and related two-dimensional materials.

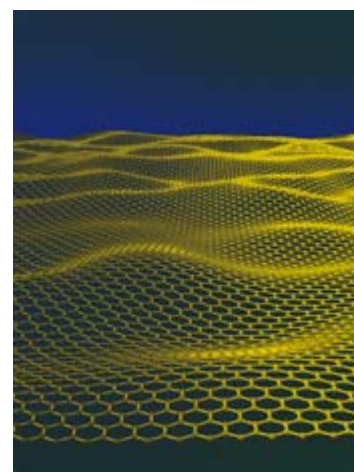
Graphene, a single layer of carbon atoms, may be the most amazing and versatile substance available to mankind. Stronger than diamond, yet lightweight and flexible, graphene enables electrons to flow much faster than silicon. It is also a transparent conductor, combining electrical and optical functionalities in an exceptional way.

Graphene can trigger a smart and sustainable carbon revolution, with profound impact in information and communication technology (ICT) and everyday life. Its unique properties will spawn innovation on an unprecedented scale and scope for high speed, transparent and flexible consumer electronics; novel information processing devices; biosensors; supercapacitors as alternatives to batteries; mechanical components; lightweight composites for cars and planes.

Cambridge's role, led by Dr Andrea Ferrari of the Department of Engineering, is to develop the science and technology roadmap for the future investment. These will be the structured plans for what new research on graphene and other two-dimensional materials is needed and the routes for the implementation of graphene in industrially viable technologies. The Cambridge team will determine what new facilities should be built in Europe for that.

"Graphene, a truly European technology, initiated in UK, is at the crossroad between fundamental research and applications. 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", says Dr Andrea Ferrari.

The groundbreaking experiments on graphene by European scientists Andre Geim and Konstantin Novoselov were awarded the 2010 Nobel Prize in Physics. Their work has sparked a



Dr Andrea Ferrari

scientific explosion, best illustrated by the exponential growth of publications and patent applications related to graphene. Huge amounts of human resources and capital are being invested into 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 research effort of individual European research groups pioneered graphene science and technology, but a coordinated European level approach is needed to secure a major role for EU in this ongoing technological revolution.

The graphene flagship aims to bring together a large, focused, interdisciplinary European research community, acting as a sustainable incubator of new branches of ICT applications, ensuring that European industries will have a major role in this radical technology shift over the next 10 years. An effective transfer of knowledge and technology to industries will enable product development and production.

The graphene flagship already includes over 130 research groups, representing 80 academic and industrial partners in 21 European countries. The coordination action is lead by a consortium of nine partners who pioneered graphene research, innovation, and networking activities. Coordinated by Chalmers University of Technology in Sweden, it includes the Universities of Cambridge, Manchester and Lancaster in the UK, the Catalan Institute of Nanotechnology in Spain, the Italian National Research Council, the European Science Foundation, AMO GmbH in Germany, and the Nokia corporation. The advisory council includes Nobel Laureates Andre Geim (University of Manchester), Konstantin Novoselov (University of Manchester), Albert Fert (THALES) and Klaus von Klitzing (Max-Planck Institute), the leading graphene theoretician Francisco Guinea (CSIC, Spain), as well as Luigi Colombo (Texas Instruments, USA) and Byung Hee Hong (SKK University, Korea), both pioneers of graphene mass production and graphene-based product development.

The pilot phase coordination action starts on May 1. Its main task is to pave the way for the full, 10 year, 1 Billion euro flagship both in terms of the organizational framework and a scientific and technological roadmap for research and innovation. The action plan for the FET Flagship will be submitted in 2012 to the European Commission, aiming for GRAPHENE to be one of the two flagships launched in 2013.

More details on the graphene flagship pilot can be found at:

[www.graphene-flagship.eu](http://www.graphene-flagship.eu)

More information on the EU Future Emerging Technology Flagship Initiative:

[http://cordis.europa.eu/fp7/ict/programme/fet/flagship/home\\_en.html](http://cordis.europa.eu/fp7/ict/programme/fet/flagship/home_en.html)

For further information please contact:

Dr Andrea C. Ferrari

Engineering Department

University of Cambridge

9, JJ Thomson Avenue

Cambridge CB3 0FA

U.K.

email: [acf26@cam.ac.uk](mailto:acf26@cam.ac.uk)

phone (CAPE) : +44 - 1223 - 748351

phone (Pembroke): +44 - 1223 - 338151

fax : +44 - 1223 - 748348

[www-g.eng.cam.ac.uk/nms/](http://www-g.eng.cam.ac.uk/nms/)

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