Published on *Digital Single Market* (https://ec.europa.eu/digital-single-market)

Digital Single Market

Projects story5 November 2013

Top Story: "Graphene: the wonder material for electronics, computers and beyond..."

You might think that such a new 'wonder material' would lie outside your everyday experience, but graphene is the exception. When you write or draw with a pencil, the graphite (the 'lead' of the pencil) slides off in thin layers to leave a trail - the line on the paper. Carbon's ability to form a thin layer of molecules is what makes graphene special - and scientists are starting to explore the possibilities for electronics and computing of carbon grids that are just one molecule thick.

The semiconductor industry is the basis of today's high-tech economy, directly supporting over 100,000 jobs in Europe, and indirectly even more. This has been achieved through continued miniaturisation in 'Complementary metal-oxide-semiconductor' (CMOS) technology, based on silicon. But this model will only last for 10 or 15 more years.

The major challenge for the ICT industry is to find alternatives for information processing and storage beyond the limits of existing CMOS. There are good indications that graphene is a prime candidate for "Beyond CMOS" components, and is, despite its revolutionary nature, complementary to conventional CMOS technologies.

Graphene has been the subject of a scientific explosion since the ground-breaking experiments on this novel material less than 10 years ago, recognised by the Nobel Prize in Physics in 2010 awarded to Professor Andre Geim and Professor Kostya Novoselov, at the University of Manchester. The remarkable electrical properties of graphene may overcome the physical limits silicon faces as transistors shrink to ever-smaller sizes - providing solutions for the "Beyond CMOS" era, needed to meet the challenges of global competition.

Bringing together multiple disciplines and addressing research across a whole range of issues, from the fundamental understanding of material properties to graphene production, the GRAPHENE [1] (1) Flagship was launched in October 2013. The proposed research includes electronics, spintronics, photonics, plasmonics and mechanics - all based on graphene.

Led by Professor Jari Kinaret, from Sweden's Chalmers University, the Flagship involves over 126 academic and industrial research groups in 17 European countries, with 136 principal investigators, including four Nobel laureates. With an initial 30-month budget of EUR 54 million, the GRAPHENE consortium will grow to include another 20-30 groups through an open call for project proposals in November [2] , worth up to a total of EUR 9 million.

read the full article [3]

Read full text [3]
Share this page

Source URL:
https://ec.europa.eu/digital-single-market/en/news/top-story-graphene-wonder-material-electronics-computers-and-beyond%E2%80%A6-0

Links
[1] http://www.graphene-flagship.eu/
[2] http://www.graphene-flagship.eu/about/open-call/
[3] http://cordis.europa.eu/result/story/rcn/12056_en.html