



## FET Flagship Pilot session

# Graphene-Driven Revolutions in ICT and Beyond

The newly launched pilot project prepares the road for the flagship initiative Graphene-Driven Revolutions in ICT and Beyond. Our goal is to secure Europe a key role in future graphene-based ICTs by providing a long term strategy of transferring knowledge and intellectual property to technological applications. We will establish a comprehensive scientific and technological roadmap, taking advantage of the existing national and European activities and incorporating contributions of selected industrial partners and key scientists. The pilot project merges physics and chemistry with engineering disciplines to develop the research agenda for the flagship initiative, and covers a wide range of research directions including electronics, spintronics, photonics, plasmonics and mechanics based on graphene. To accomplish these aims, we will work closely with other flagship pilots on issues of common interest, and integrate the views of the EC and other stakeholders in the planning for the new flagship.

The ambition of the flagship initiative is to bring together a focused, interdisciplinary European research community that aims at a radical technology shift in information and communication. Graphene research is an example of an emerging translational nanotechnology where discoveries in academic laboratories are rapidly transferred to applications. Graphene has the potential to make a profound impact in ICT in the short and long term: Integrating graphene components with silicon-based electronics, and gradually replacing silicon in some applications, allows not only substantial performance improvements but, more importantly, it enables completely new applications. We will develop graphene electronics that can sustain ICT devices and technologies evolution beyond the limits achievable with silicon. By exploiting the unique electrical and optical properties of graphene, we will develop novel electronics systems with ultra-high speed of operation and electronic devices with transparent and flexible form factors. We will advance methods to produce cheap graphene materials which combine structural functions with embedded electronics, in an environmentally sustainable manner. The flagship initiative will extend beyond mainstream ICT to incorporate novel sensor applications and composite materials that take advantage of the extraordinary chemical, biological and mechanical properties of graphene.

### Speakers:

- Andrea Ferrari, Cambridge Univ.
- Jari Kinaret, Chalmers Univ.
- Vladimir Falko, Lancaster Univ.
- Jani Kivioja, NOKIA

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