

# **Graphene and 2d crystals: from research labs to the market place**

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Technological progress is driven by developments in material science. Breakthroughs can happen when a new type of material with different dimensionality and functionality are created. Graphene, because of its many superior material properties, has the opportunity to enable new products. Graphene is just the first of a new class of two dimensional (2d) materials, derived from layered bulk crystals. The assembly of such 2d crystals (heterostructures) will provide a rich toolset for the creation of new, customised materials. In this lecture I will first provide an overview of the key aspects of graphene, 2d crystals and heterostructures for their applications in a large number of sectors, highlighting the roadmap to take graphene and 2d crystals from a state of raw potential to a point where they can revolutionize multiple industries: from flexible, wearable and transparent electronics to high performance computing. I will then review the state of the art of graphene and 2d crystals production, processing and placement. Finally, I will give a brief overview on their applications in flexible transparent conductors, smart windows, ultrafast lasers, dye sensitized solar cells and Li-ion batteries.