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Graphene nanodevice design and pathways to industry

Graphene nanosystems have vast potential to be used in the development of energy-efficient, low power and low loss devices, such as solar cells, batteries and transistors, for example. However, there remains substantial challenges in developing fabrication processes for nanographene that produce precision-designed systems for targeted applications and successful industry mass-production. Such challenges are linked to the properties of nanographene being highly sensitive to system size, edge structure, patterning and chemical functionalisation—to name just a few design parameters. Although this versatility means opportunities in materials discovery, it also presents practical difficulties in materials design and production, which can be assisted by accurate and fast simulation. In this presentation, I will give an overview of graphene nanosystems research and development, covering progress in both top-down and bottom-up methods of fabrication, as well in device modelling. On the latter, I will also present my group's work and within this context, discuss the development of accurate simulation to advance nanographene to its full commercial potential.

Biography

Y Hancock obtained her PhD in 2003 at Monash University in Melbourne, Australia, with specialization in Theoretical Quantum Physics and Engineering of Nanoscale Technologies. While at Aalto University in Helsinki from 2006-2009, she was the Research Manager of a large-scale collaboration with the Nokia Corporation where one of the projects that she supervised was the application of graphene in next-generation mobile technologies. Since 2009, she has been at the University of York, UK, where she leads research in developing models for realistic simulation of nanographene and for graphene device design.

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