

ISGD-5

5th INTERNATIONAL SYMPOSIUM ON GRAPHENE DEVICES

GRAPHENE: THE JOURNEY FROM THE NANODOMAIN TO MACROSCOPIC DEVICES

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The journey to the nanodomain has enabled researchers to discover amazing properties in even the most mundane materials. Now our challenge is to journey back to macroscopic world of structures and devices bringing these properties with us.

The exceptional properties of nanostructured carbons remain a fascination for materials scientists. There is something intriguing about the ability to create and control carbon structures in a way that nature does not to deliver unprecedented performance. Here we will draw on advances in the synthesis and processing of nanostructured carbons (graphene and carbon nanotubes) to enable the assembly/fabrication of structures for energy conversion and storage as well as for biomaterials. A range of chemistries have been developed to enable solution processing of carbon nanotubes and/or graphene to form novel electrodes or highly effective composites with other engineering and/or biomaterials as hosts.

Control over functionalization and physical dimensions leads to the ability to control the rheological properties of dispersions containing these materials. This in turn leads us to the ability to engineer novel fabrication strategies that fall under the umbrella of additive fabrication. These include fibre spinning, knitting/braiding and 3D printing.

The impact of carbon nanostructured electrodes and their use in electrochemical devices including solar cells, biofuel cells, thermoelectrochemical cells, batteries and capacitors, as well as in medical bionics will be discussed.

References

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