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The Helium-ion Microscope (HIM) is a recent development in the family of charged particle microscopes. It is a versatile tool capable of primary objective is to develop the HIM to achieve atomic-level characterization of graphene samples and to fabricate graphene-based nanostructures and functional nanodevices. We explore the fundamental aspects of ion-sample sub-nanometre-scale characterization, modification and machinery. Graphene is one of the most important nanomaterials in recent years due to its exceptional properties. Applications of graphene-based nanodevices are only truly practical if the basic graphene functional building block has the properties demanded, and device fabrication techniques are optimized. Our interaction in terms of image formation and material milling. Through the investigation of graphene imaging and machinery, we will gain fundamental knowledge of HIM image formation, ion-induced beam damage in low-dimensional materials and nanoscale ion milling.

Prof. Zhang received his PhD in Applied Physics at Rice University (US) in 1999. He is a SFI Stokes Lecturer at the School of Physics, Trinity College and a Principal Investigator at CRANN (the Centre for Research on Adaptive Nanostructures and Nanodevices. A significant part of his research is concerned with controllable synthesis and modification of low-dimensional nanostructures with the primary objective being specific physical properties. It involves design, growth, characterisation and applications of novel nanostructures and nanodevices. His recent research activities are primarily focused on developing and applying new electron/ion beam methodologies for nanoscale characterization and modification, especially on the helium ion microscopy and in-situ experiments. He has co-authored over 110 peer reviewed papers and has a research H-index of 24.

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