Imaging electrons in graphene nanostructures

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Graphene has great promise for quantum devices with atomic dimensions [1, 2]. Research has developed novel techniques to make atomic-scale structures in graphene, understand their stability, and their electronic behaviour. We present methods to fabricate suspended graphene nanostructures using the electron beam of a high-resolution transmission electron microscope, and we describe the implementation of a scanning capacitance probe operating at liquid helium temperatures that is designed to probe electron motion in these devices. The capacitive probe senses electrons using a cooled charge amplifier [3]. We have achieved a low noise figure for this technique, which show great promise as a tool to study the electronic behaviour of nanoscale devices.

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