

Abstract Submitted  
for the MAR10 Meeting of  
The American Physical Society

**Graphene Nanoribbons Fabricated by Helium Ion microscope** D. PICKARD, B. OEZYILMAZ, J. THONG, K.P. LOH, V. VISWANATHAN, A. ZHONGKAI, S. MATHEW, T. KUNDU, C. PARK, Z. YI, X. XU, K. ZHANG, T.C. TAT, H. WANG, T. VENKATESAN, NanoCore NUS Singapore, G. BOTTON, M. COUILLARD, McMaster U, NANOCORE NUS SINGAPORE TEAM, MCMASTER U COLLABORATION — Graphene, a monolayer graphitic lattice of carbon atoms has tremendous promise for a variety of applications on account of the zero mass of electrons, high mobility and the sensitivity of transport to perturbations at the interface. Patterning graphene is an obvious challenge and mesoscopic devices based on graphene require high spatial resolution patterning that will induce as little damage as possible. We use a helium ion microscope with its 0.4nm spot size beam to directly write patterns on free standing graphene films. TEM images of the patterns reveal holes as small as 4 nm and ribbons with line widths as narrow as 3 nm. The images show recovery of the graphene lattice at a distance of about a nm from the patterned edge. The linewidths of the ribbon can be varied considerably in a controllable fashion over ribbon lengths of the order of microns. . .

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Date submitted: 04 Jan 2010

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