Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Atomic Step-Templated Formation of Single-Wall Carbon Nanotube Patterns ERNESTO JOSELEVICH, ARIEL ISMACH, LIOR SEGEV, ELLEN WACHTEL, Weizmann Institute, Israel, ADO JORIO, UFMG, Brazil, HYUNGBIN SON, GENE DRESSELHAUS, MILDRED S. DRESSELHAUS, MIT — **Single-wall carbon nanotubes catalytically produced on miscut C-plane sapphire wafers grow along the 0.2nm-high atomic steps of the vicinal αAl_2O_3 (0001) surfaces, yielding highly aligned, dense arrays of discrete nanotubes on a dielectric material [1]. The nanotubes reproduce the atomic features of the surface, including steps, facets and kinks. Microscopy, X-ray diffraction and single-nanotube Raman spectroscopy [2] shed light into the possible structure and mechanism of the step-templated carbon nanotube growth. The orientation, density and morphology of the atomic steps can be macroscopically controlled by the crystal cutting process. Hence, these findings open up the possibility of assembling nanotube architectures by atomic-scale surface engineering.** [1] A. Ismach, et al., *Angew. Chem. Int. Ed.* **2004**, 43, 6140. [2] M. Souza, et al., *Phys. Rev. B* **2004**, 241403R.

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Date submitted: 01 Dec 2004 Electronic form version 1.4