Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Nanotube Epitaxy ERNESTO JOSELEVICH, ARIEL ISMACH, DAVID KANTOROVICH, NOAM GEBLINGER, JONATHAN BERSON, LIOR SEGEV, ELLEN WACHTEL, Weizmann Institute, Israel, ADO JORIO, UFMG, Brazil, HYNGBIN SON, GENE DRESSELHAUS, MILDRED S. DRESSELHAUS, MIT — A review is presented of the organization of carbon nanotubes by substrate-directed growth on crystal surfaces. The production of ordered carbon nanotube arrays on surfaces is a critical prerequisite for their large-scale integration into nanocircuits. We have recently elaborated a series of surface-directed mechanisms of carbon nanotube growth, which can be classified as different modes of "nanotube epitaxy". These epitaxial modes of carbon nanotube growth include "lattice-directed epitaxy" (by atomic rows), "ledge-directed epitaxy" (by atomic steps) [1], and "graphoepitaxy" (by nanofacets) [2]. Some of these epitaxial modes can be simultaneously combined with electric-field directed growth [3] for the orthogonal self-assembly of carbon nanotube crossbar architectures [4]. Nanotube epitaxy with different crystal surfaces yields unprecedented carbon nanotube array morphologies, including highly straight, kinked, wavy, crossbar, serpentine [5], and more. [1] Ismach, et al., *Angew. Chem. Int. Ed.* **2004**, 43, 6140. [2] Ismach at al. *J. Am. Chem. Soc.* **2005**, 127, 11554. [3] Joselevich et al., *Nano Lett.* **2002**, 2, 1137. [4] Ismach et al. *Nano. Lett.* **2006**, 6, 1706. [5] Ismach et al., in preparation.

Ernesto Joselevich
Weizmann Institute, Israel

Date submitted: 20 Nov 2006 Electronic form version 1.4