

Abstract Submitted  
for the GEC05 Meeting of  
The American Physical Society

**Nanofabrication of single-crystalline flat panel display microemitter arrays: a “plasma-building unit” approach** KEN OSTRIKOV, School of Physics, The University of Sydney, Australia, SHUYAN XU, Plasma Sources and Applications Center, NIE, NTU, Singapore — This contribution is focused on PECVD systems used for nanofabrication of flat panel display microemitter arrays based on ordered patterns of single-crystalline carbon nanotip structures (CNSs). The fundamentals of the plasma-based nanofabrication of CNSs and other nanofilms and nanostructures are critically examined and compared with CVD processes. Specific features, challenges, and potential benefits of using the reactive plasma-based systems for relevant nanofabrication processes are analyzed by using the “plasma-building unit” approach that builds up on extensive experimental data on plasma diagnostics and nanofilm/nanostructure characterization, and numerical simulation of the species composition in the plasma (fluid models), ion interaction with ordered carbon nanotip patterns (MC simulation), and computations of chemical structure of single crystalline carbon nanotips (DFT technique). This approach is also applicable for nanoscale assembly of other carbon nanostructures, polymorphous silicon films, semiconductor quantum dot structures, and nano-crystalline bioceramics. Special attention is paid to control strategies of the building units in the plasma phase and on nanostructured deposition surfaces. The issues of tailoring the plasma and development of plasma nanofabrication facilities are also discussed.

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Date submitted: 17 May 2005

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