Networking Carbon Nanotubes for Integrated Electronics. J.M. ROMO-HERRERA, M. TERRONES, H. TERRONES, Advanced Materials Dept IPICyT, Camino Presa Sn Jose 2055 Lomas 4a Sec, SLP 78216 Mexico, V. ME-UNIER, Computer Science & Mathematics Div and CNMS, ORNL POBox 2008, TN 37831-6367 USA — The unique electronic and mechanical properties of individual Carbon Nanotubes (CNTs) have attracted much interest as candidates for molecular electronic devices and reinforced materials. However, their integration in organized architectures remains a major challenge. Recent breakthroughs reported on the Self-Assembly of 1D Nanostructures[1], and on the coalescence mechanism for interconnecting CNTs[2], point to the possibility of designing and obtaining Ordered Networks based on CNTs (ON- CNTs). We propose a set with different complex architectures of ON- CNTs based on –but not limited to– armchair and zigzag nanotubes. In addition to the study of the energetics of the structures, we have systematically investigated their electronic transport properties in the framework of the Landauer-Buttiker formalism and equilibrium Green functions. To take curvature into account, we employed a semi-empirical Hamiltonian based on 4 orbitals (s,px,py,pz) per carbon atom. Further insight is obtained analyzing the electron pathways from a scattering point of view, which allows a real-space analysis of the wave function from the transmitted electrons across the structure. [1]Whang D *etal.* **Nanoletters,3** (2003). Tao A *etal.* **Nanoletters,3** (2003). [2]Terrones M *etal.* **PRL**,**89** (2002). Endo M *etal.* **Nanoletters**,**5** (2005).

Humberto Terrones
Advanced Materials Dept, IPICyT, Camino a la Presa Sn Jose 2055, Lomas 4a Sec, SLP 78216 Mexico.

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