

Physics Colloquium

Michigan Technological University

Thursday, October 7, 2010

4:00 pm

Room 139 Fisher Hall

DNA-Carbon Nanotube Interaction: Fundamentals and Applications

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Abstracts: DNA is the material that Nature has selected for carrying genetic information in living cells. Its central role in biology and its unique physical-chemical properties have been the constant source of motivation for investigation by different disciplines. Carbon nanotube (CNT) is a relatively new man-made material with beautiful atomic and fascinating electronic structures. It has potential for many technological applications. A few years ago, we identified a strong interaction between DNA and CNT that is dependent on both the DNA sequence and the CNT structure. This finding has prompted not only theoretical exploration of the nature of the interaction, but also technological exploitation of the interaction in areas ranging from electronic devices to rapid DNA sequencing. In this talk, I will show the use of DNA as a powerful molecular tool to solve a recalcitrant problem in the CNT field - separation of a synthetic mixture of single wall CNTs into pure chirality species, and discuss new insight into DNA structural properties derived from the DNA-CNT hybrids.

References:

Zheng, M. et al. *Nat Mater.* **2**, 338-342 (2003).

Zheng, M. et al. *Science* **302**, 1545-1548 (2003).

Tu, X., Manohar, S., Jagota, A. & Zheng, M. *Nature* **460**, 250-253 (2009).

Biography: Dr. Zheng received his BS (1984) and MS (1987) in Electronics from Peking University, a MS degree in Physics in 1990 from University of Utah, and his Ph.D. in Chemistry from Princeton University in 1995. He was an American Cancer Society Postdoctoral Fellow in the National Institutes of Health from 1996 to 2000. From 2000 to 2009, he was a principal investigator at DuPont Central Research and Development. In 2009, Dr. Zheng joined National Institute of Standards and Technology where he is now a staff scientist.

