

Physics Colloquium

Michigan Technological University

October 14 (Thursday) 4:00 to 5:00 pm
Room 139, Fisher Hall

In-situ Fluid Studies in Multi-walled Carbon Nanotubes

Yury Gogotsi

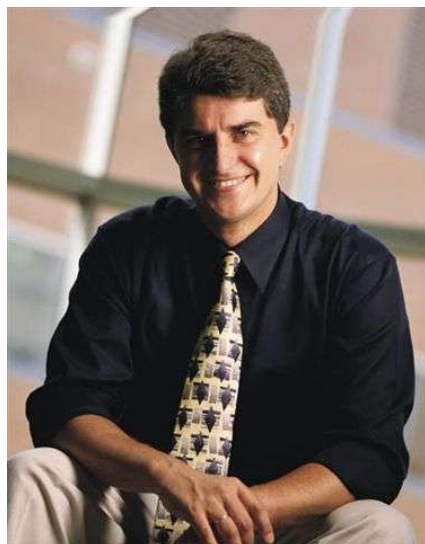
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Abstract

The processes that govern fluid transport in pipes are well understood for diameters in the range of micrometers and above. As the diameters diminish (e.g. in the range of a few nanometers), the roles of surface tension and capillarity seem to vary. Thus, the expected promise of carbon nanotubes (CNT, 1-50 nm inner diameter) and nanopipes (CNP, 50-300 nm inner diameter) in technological applications is in urgent need of a well-documented, basic understanding of such forces, especially since no consistent experimental data have been collected until recently. We have investigated the liquid/vapor distribution in nanotubes, the interaction of fluids with the tube walls, and the effect of hydrothermal treatment on the surface chemistry of carbon nanotubes. On this basis, we are developing a research program that will thoroughly explore the various aspects of phase interfacing in a number of different nanotube situations. This seminar will give an overview of experimental studies of behavior of aqueous fluids in carbon nanotubes.

Biography

Dr. Yury Gogotsi is Professor of Materials Science and Engineering at Drexel University. He



also holds appointments in the Departments of Chemistry and Mechanical Engineering at Drexel University and serves as Director of the A.J. Drexel Nanotechnology Institute. He received his MS (1984) and PhD (1986) degrees from Kiev Polytechnic and a DSc degree from the Ukrainian Academy of Science in 1995. His research group works on nanotubes, nanostructured carbons, nanofluidics, and pressure-induced phase transformations in ceramics and semiconductors. He co-authored two books, edited four books, obtained 20 patents and authored more than 100 research papers.

He received several awards for his research including I.N. Frantsevich Prize from the Ukrainian Academy of Science, S. Somiya Award from the International Union of Materials Research Societies, Kuczynski Prize from the International Institute for the Science of Sintering, Roland B. Snow Award from the American Ceramic Society, and R & D 100 Award for research on nanostructured Carbide-Derived Carbon in 2003.