

# Physics Colloquium

Michigan Technological University

Thursday, September 13, 2012

at 4:00 pm

Room 139 Fisher Hall

**Energy, Nanoscience, and Thermoelectrics**

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**Abstract:** Energy is one of the several grand challenges facing the 21<sup>st</sup> century society. Current worldwide production of power is ~18 TW and expected to grow to ~30 TW by 2050. Against this huge demand, known supply of fossil fuel (oil and gas) is shrinking and recovery of fuels from new sources is becoming increasingly dangerous and costly. Also burning fossil fuel is adding billions of tons of greenhouse gases to the atmosphere, a major cause of global warming. Thus there is a pressure to increase the use renewable sources of energy and also to increase the efficiency of current power production and use. Nano science is playing more and more important role in attacking some of these energy-related issues. I will discuss how nanoscience is helping improving efficiency in waste-heat recovery and power generation process through novel thermoelectrics

**Biography:** Professor S. D. Mahanti was born in Cuttack, India, in 1945. He received his B.Sc (Honors in Physics) and M.Sc (Physics) degrees in India. After doing research at Allahabad University in an Indo-US project, he came to the United States in 1964 and did his Ph.D. in Theoretical Condensed Matter Physics at the University of California, Riverside (1964-1968). After working for two years at Bell Telephone Laboratories, Murray Hill, New Jersey, he joined the physics faculty at Michigan State University in 1970, where he is a Professor. He served as the Associate Director of Center for Fundamental Research and the Director of the physics graduate program. at MSU. He has been visiting professor at several leading institutions in Europe and India. He is a Fellow of the American Physical Society. His research interests are quite broad with special focus on the electronic structure of complex systems. His research over the years has been in the area of magnetic materials, high  $T_c$  superconductors, multi-ferroics, systems showing colossal magnetic resistance, and high performance thermoelectrics. Currently, his focus is on energy related issues, particularly how and where nanoscience can make an impact. He has co-organized several national and international conferences, published more than 260 papers in reputed journals, has been reviewer for many journals, and member of several research proposal evaluation panels.