

**SCHOOL OF PHYSICS**

**UNIVERSITY OF NEW SOUTH WALES**



# COLLOQUIUM

*4-5 p.m., Tuesday, 17 March, 2009*

School of Physics Common Room

Room 64, Old Main Building

**Professor Heiner Linke**

**Physics Department, University of Oregon, USA and**

**The Nanometer Structure Consortium, Lund University, Sweden**

## **“Nanoscale Energy Converters: From Molecular Motors to Nanothermoelectrics”**

As the size of a motor is reduced to the nanoscale, thermal noise and quantum effects become large compared to the energies that drive the motor, changing its behavior fundamentally from that of macroscopic, everyday machines.

So-called Brownian motors or ratchets incorporate thermal fluctuations as an integral part of the operational principle of nanoscale machines and can actually outperform macroscopic machines. I will introduce the basic ratchet concept in the context of biomolecular motors, and will discuss several examples from our research, ranging from liquid droplets coaxed by a ratchet to move uphill, via models for biological molecular motors, to the highly efficient conversion of heat into electricity in quantum-dot based devices.

The audience is invited to meet the speaker beforehand at 3.45 p.m. over coffee and biscuits in the Common Room.

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