

# Seminar

## **Professor Gerard J Milburn**

Centre for Quantum Computer Technology  
School of Physical Sciences  
The University of Queensland

### **Quantum electromechanical systems: from Bohr to buckyballs**

-12.15pm-

-Thursday 8th June 2006-

- Rankine Brown 106, Victoria University of Wellington-

-Video Conference Room, C-Block, IRL, Gracefield Site, Lower Hutt-

-Level-3 lecture theatre (A309), ELEC Dept Building, Canterbury University-

- ScB2.09, Science Tower B, Level 2, Massey University-

-Conference Room 2, Otago University-

Current nanotechnology makes it possible to fabricate small mechanical oscillators which at low temperature behave as fully quantum mechanical systems. Typically these devices are sub micron, which is too small for optical transducers and typically require milli Kelvin single electronics for transducers. QEMS devices are now approaching the Heisenberg limit for position sensitivity. In this talk I will discuss the quantum mechanics of nano electromechanical systems, beginning with the Bohr-Einstein debate on quantum limits to position and momentum measurements. I will discuss recent experimental results in QEMS devices including the fullerene single electron transistor, the quantum shuttle, ion trap transducers and conclude with some speculations on the role of QEMS systems in biology.



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