SCHOOL OF PHYSICS

UNIVERSITY OF NEW SOUTH WALES

COLLOQUIUM

4-5 p.m., Friday, 24 April, 2009

School of Physics Common Room
Room 64, Old Main Building

Dr Pinaki Sengupta
Los Alamos National Labs, USA

"The Spin Supersolid Phase"

The supersolid is a unique state of matter that exhibits simultaneous solid and superfluid features. First proposed by Penrose and Onsager half a century ago, this novel phase has never been conclusively observed in nature (although some recent experiments have shown potential signatures of it in solid He4 under certain conditions). Theoretical studies have shown that a thermodynamically stable supersolid phase can be stabilized in the presence of an underlying lattice (or a periodic potential). I shall present a simple and intutive mechanism leading to the formation of a lattice supersolid, and discuss in detail our recent work on the spin analog of a supersolid phase. I shall argue that spin systems hold the greatest promise for observing this unique phase in real materials. I shall talk about the experimental signatures of such a phase and present several scenarios under which a spin-supersolid can be realized in real spin compounds.

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

Dr. Adam Micolich
Ph.: (02) 9385-6132
e-mail: mico@phys.unsw.edu.au

*** Dr Sengupta is a candidate for the School's new Condensed Matter theory position**