

**Paul Giles**

**The X-ray Properties of Weak Lensing Selected Galaxy Clusters**

Abstract:

We present work detailing an X-ray follow up campaign of Subaru weak lensing selected galaxy clusters. This work details the X-ray observations of 10 of the most secure cluster candidates. We construct X-ray scaling relations of these clusters and compare to X-ray selected cluster scaling relations. We also construct an luminosity-mass scaling relation for the weak lensing selected clusters and show that these clusters are under-luminous compared to the predominantly X-ray selected population.

**David Phillips**

**'Towards All Optical Scanning Probe Microscopy'**

Abstract:

In my talk I shall describe some of the work we have carried out towards developing a Scanning Probe Microscopy (SPM) like technique using holographic optical tweezers. I shall briefly introduce SPM, and describe how we trap and track the SPM probes in two and three dimensions, and show some of the proof of principle results we have achieved to date. I shall then discuss the current and potential imaging sensitivity and resolution, and talk about how this may be improved by developing probes with sharper tips, and optically damping their thermal motion.

**Andy Smerald**

**"Searching for the elusive: how to find spin nematic order"**

Abstract:

In magnets with a high degree of frustration, conventional magnetism can melt away and one enters the strange world of quantum order. One possibility is that a spin nematic state is formed - the quantum spin analogue of the liquid crystal. We explore how one could detect this unusual state of matter.