

**Department of Mechanical Engineering
Monash University
Departmental Seminar**

**Monday 11 December 2007
11 am – 12 pm
Lecture Theatre E7 Building 72 Clayton Campus**

**PISTON LUBRICATION MODELLING
IN INTERNAL COMBUSTION ENGINES
Ms Fiona McClure
Sloan Automotive Laboratory
Massachusetts Institute of Technology, USA**

With increasingly stringent vehicle emissions standards, concern about environmental impact, and high fuel costs there is a continuing drive to improve internal combustion engine efficiency and reduce oil consumption. Approximately 50% of friction within a typical car engine is due to the power cylinder system, with around 30% of this being due to the piston.

Our current research aims to create an accurate numerical model of piston secondary motion and skirt lubrication in internal combustion engines. More specifically, this research includes dynamic modelling of a non-linear, multi-body system with interface sub-models ranging from an ideal, frictionless, pin-joint to detailed elastohydrodynamic lubrication with considerations of surface texture (tooling marks) and solid-solid contact, and tracking of oil transport. This research will improve our understanding of the way in which side-impact forces and friction are generated, and oil is transported, within the power cylinder system, and in the longer term we hope this will lead to reductions in friction, wear, noise and oil consumption.

Fiona is currently a PhD candidate in the Sloan Automotive Laboratory at Massachusetts Institute of Technology. She completed her Master of Engineering degree at McGill University in Montreal, and her Bachelor of Engineering/Bachelor of Science degrees at The University of Melbourne.