The University *of* Western Ontario
Faculty of Science
Department of Applied Mathematics

APPLIED MATHEMATICS COLLOQUIUM

Date: Wednesday, August 5, 2009

Time: 2:30 pm

Location: Middlesex College, Room 204

Rolling Nanoparticles in 2D

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Abstract:

Abstract: In this talk, I will describe some recent results of our theoretical modelling of rolling friction at the nanoscale. The system studied is a single nanoparticle placed between two surfaces, one stationary and the other pulled at a constant velocity and pressed down by a normal load. This system, although simple, can exhibit non-trivial and counterintuitive behaviour. It can exist in three principle friction states, viz. the rolling state, the superlubric state of practically zero friction, and the high-friction state. The nature of these friction regimes will be examined, the state diagram will be presented, and various switching and hysteresis effects will be predicted and explained.