PIMS / AMI Seminar

Friday, March 8, 2013
3:00 p.m.
CAB 657

"Geometry and symmetry in multi-physics models for magnetized plasmas"

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Abstract

Modeling magnetized plasmas often requires incorporating microscopic and macroscopic effects at the same time. This can be achieved by nonlinear multi-physics models coupling microscopic kinetic theories with the macroscopic effects of fluid motion. Most often, these models are obtained by making physical assumptions on the equations of motion, although this operation may destroy fundamental properties such as energy conservation (even in the absence of dissipation). I will show how the use of symmetry in Hamiltonian/Lagrangian systems provides a unifying framework for coupling conservative kinetic and fluid theories in a consistent way. As a result, new Coriolis force terms appear in the equations of motion that were unknown to the plasma community. Particular applications to astrophysical and fusion plasmas will be considered.

Refreshments will be served in CAB 649 at 2:30 p.m.