



Western University
DEPARTMENT OF PHYSICS AND ASTRONOMY

PHYSICS & ASTRONOMY COLLOQUIUM

Date: Thursday, 17th November 2016
Time: 1:30 p.m.
Location: Physics & Astronomy Seminar Room 100

Dr. Hanno Rein

Department of Physical & Environmental Sciences
University of Toronto, Scarborough

“Simulating the Solar System for 10 billion years at machine precision: Numerical challenges and physical results”

ABSTRACT

Many well-known mathematicians and physicists have tried to answer a simple question: Is the Solar System stable? Despite our knowledge of the governing equations for over 300 years, the fact that we only consider 9 bodies, and the advent of computers, simulating the dynamics of the Solar System over long timescales remains frustratingly hard and the most basic questions about the stability of the Solar System have only been answered in the last decade.

I will discuss why this simple physical system is so hard to solve and how the field evolved historically. I will then present the latest results and the physical theories that might be able to explain them. I will spend some time explaining why the details of the numerical implementation matter so much in this case and how to get them right. In the last part, I'll show how you can now run your own super precise simulations with the open source code REBOUND.

COFFEE + light snacks will be available in the Atrium, 2nd floor, at 1:15 p.m.