

**RYERSON UNIVERSITY  
DEPARTMENT OF MATHEMATICS  
BIOMATHEMATICS & FLUIDS SEMINAR**

**Dr. Hossein Zivari-Piran**

Center for Disease Modelling,  
Department of Mathematics and Statistics, York University

Date: Thursday, November 21, 2013

Time: 11:10

Location: ENG 210

**Numerical study of a large-scale model for  
measles spread**

**Abstract:**

In this talk I describe the dynamics of a model of measles infection developed by Heffernan and Keeling (2008). The combined immunological (in-host) and epidemiological (between-host) model includes waning immunity and vaccination and is formulated as a large-scale system of ODEs. I show how the dynamics of this system changes as the parameters controlling waning time and vaccination level vary. The relevant local and global bifurcations are investigated using special numerical methods for large-scale systems, leading to a novel approach for explaining the mechanisms underlying the oscillatory dynamics of measles. I will discuss our framework for bridging between immunological and epidemiological dynamics of measles and how it can be adapted for other infectious diseases.

ALL FACULTY, STAFF, STUDENTS AND GUESTS ARE WELCOME TO ATTEND  
LIGHT REFRESHMENTS WILL BE PROVIDED