



NITheP cordially invites you to a seminar by:

Dr. Ian Parrish

Canadian Institute for Theoretical Astrophysics (CITA)

Date: Monday, 9th May 2016

Time: 13h00 -14h00

Venue: NITheP Seminar Room

Title: "Galaxy Clusters from Inside to Out: Thermal Instability and Non-thermal Pressure Support"

Abstract: Clusters of galaxies are the largest gravitationally-bound objects in the universe, and as such are useful as probes of both cosmology and astrophysics. To understand these objects as well as related problems in galaxy formation and black hole growth, we must understand the hot, dilute intracluster medium (ICM) that dominates the baryonic mass. In the cores of cool-core galaxy clusters, I will explore the balance between heating and cooling processes and explain when and how thermal instability occurs. The resulting cool gas can form filaments or feed a central black hole. Our results are in good agreement with recent observations and have broad implications for feedback across many scales. I will describe a degree of thermal self-regulation of clusters and hot halos that can be achieved from this process and its consequences. Finally, I will move to the cluster outskirts and highlight the role of conduction-driven convection in the outskirts of galaxy clusters. This convection is driven by a unique plasma physics instability, the magnetothermal instability (MTI). The non-thermal pressure support from this vigorous convection has implications for our interpretation of ongoing SZ survey.