

**Fluids at Brown, Division of Applied Mathematics  
Fluids and Thermal Sciences, School of Engineering  
Joint Seminar Series**

**TUESDAY – February 7, 2017  
3:00 PM  
Barus & Holley, Room 190**

**Dr. Damien Parrello,  
McMaster University, Chemical engineering dpt., ON, Canada**

**Compact representation of multidimensional data sets**

**ABSTRACT:** Using a classical one-to-one map introduced by Cantor at the end of the 19th century, we plot a number of multidimensional data sets and discuss observed patterns of interest. Remarkable regularities are shown over a number of diverse sets: From protein structures to galaxies distribution, via cell dynamics, active area distribution in the human brain, local climate dynamics, and stars distribution of all stars within 50 parsecs from the sun. Preliminary properties and potential applications are discussed.

**BIOGRAPHY:** Dr. Parrello received his PhD in biogeochemistry from the Lorraine University, Nancy, France where he developed a multi-way data analysis for modelling the dynamic expression of a set of genes as a function of crossed parameters using fluorescent whole cell biosensors. He continued to explore biological systems in Dr. Hu's group, University of Missouri, Civil and Environmental Engineering department (USA), and tagged the central regulatory genes to monitor the dynamics of biological functions in complex environments. He then joined Dr. Latulippe's lab, McMaster University, Chemical engineering department (Canada), to apply his knowledge in synthetic and systems biology for the development of new wastewater treatment processes.