NITheP cordially invites you to a seminar by:

Prof Johannes Zimmer
Department of Mathematical Sciences, University of Bath, UK

Date: Wednesday 1 April 2015
Time: 14:00
Venue: NITheP Stellenbosch node, Seminar Room

**Title:** The geometry of dissipative evolution equations

**Abstract:** Physical systems often seek to evolve towards the maximum of a functional, such as the entropy, but what governs the direction for the evolution? One could intuitively guess that the direction is that of steepest ascent, but such optimality requires the notion of a gradient. The latter is often neither unique nor intuitive. We will mention one example, namely the so-called Wasserstein geometry, in which entropy experiences the steepest descent for diffusion processes. How can we find this underlying geometry? A maximum entropy production principle will be formulated to derive the underlying geometry, potentially offering a unifying framework for the formulation of a range of dissipative equations. The talk will introduce the relevant concepts. At the end of the talk, it will be mentioned that the variational structure of this principle encloses an infinite-dimensional fluctuation-dissipation statement, as shown from a large deviation argument for stochastically perturbed gradient flows.

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