Berlin Mathematical School

BMS Friday Colloquium

Friday 27 May 2011 at 14:15

Tea before the lecture begins at 13:00

BMS Loft, Urania, An der Urania 17, 10787 Berlin

A. Bogard, 2009

Ulisse Stefanelli

(Institute for Applied Mathematics and Information Technology - IMATI)

Evolution = Minimization ?

The equilibrium of a physical system is often characterized in terms of a suitable variational principle. Generally speaking, given the energy of a system, the quest for actual states reduces to the minimization of that energy.
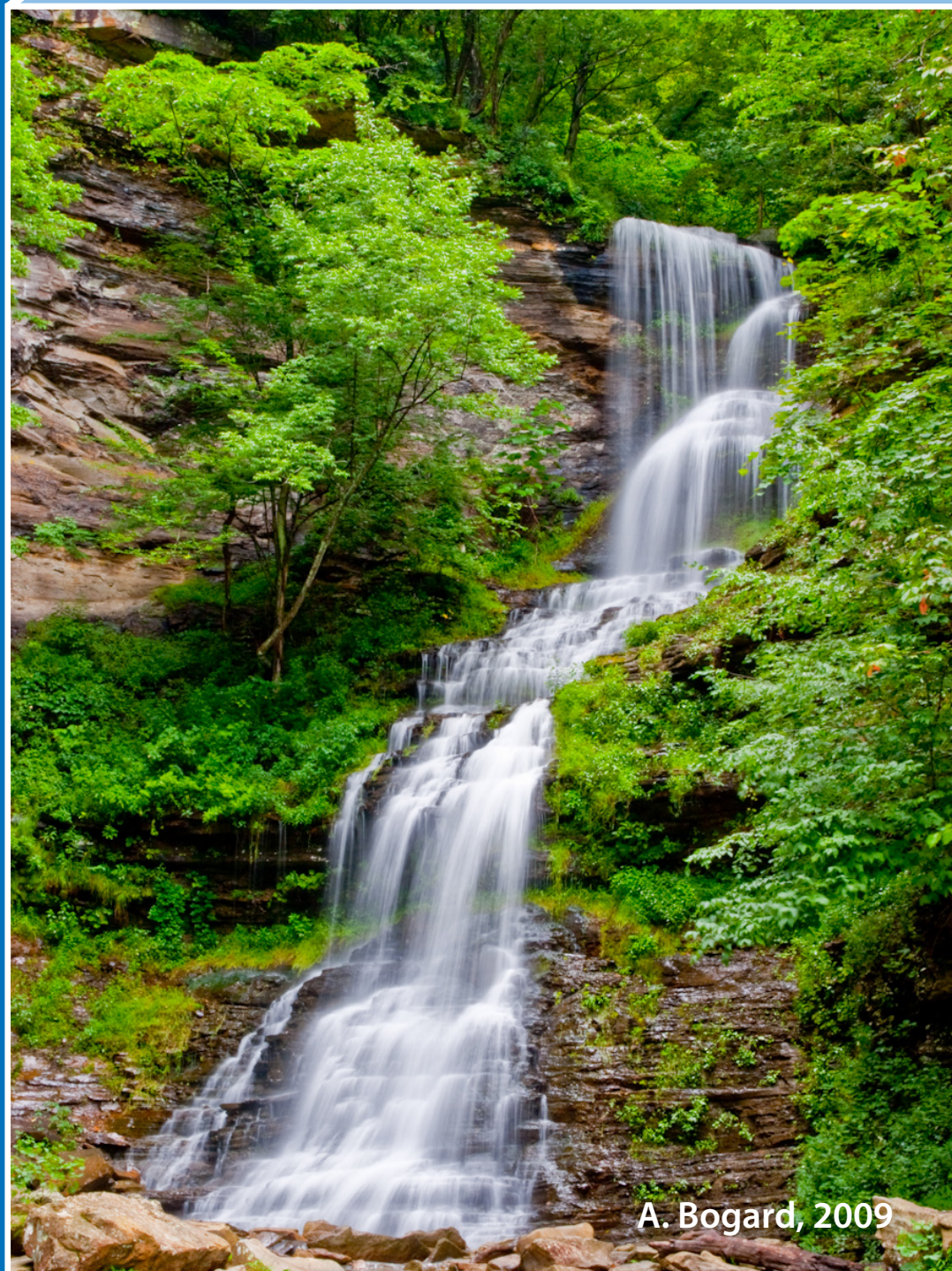
Does this extend to evolution problems?

Ulisse Stefanelli will be presenting some material on the possibility and the usefulness of addressing variational principles for evolution problems. The interest for this perspective is that of moving the successful machinery of the Calculus of Variations to evolution problems.

The idea of characterizing evolution variationally is not new. Stefanelli will review some very classical results in both parabolic and hyperbolic situations with an emphasis on prototypical cases of gradient flows and Lagrangian Mechanics.

Research in this field is rapidly developing. A glimpse into actual directions will be presented including a result in the direction of a conjecture by De Giorgi on the elliptic regularization of semilinear wave equations.

Ulisse Stefanelli is a senior researcher at the Institute for Applied Mathematics and Information Technology (IMATI) in Pavia and professor at the University of Pavia. He won an ERC Starting Grant for his project on Mathematics for Shape Memory Technologies in Biomechanics. In 2010, he received the Richard von Mises Prize from the International Association of Applied Mathematics and Mechanics (GAMM).

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