De: **CRM** CRM@CRM.UMontreal.CA
Objet: ** AUJOURD'HUI ** Série de conférences Chaire Aisenstadt - Selim Esedoglu (Michigan)
Date: 7 avril 2016 10:30
À: activites@crm.umontreal.ca

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CHAIRE AISENSTADT CHAIR 2016
Centre de recherches mathématiques
Série de conférences / Series of lectures

Semestre thématique du CRM
Les mathématiques computationnelles dans les applications émergentes

CRM Thematic Semester
Computational Mathematics in Emerging Applications

Selim Esedoglu (University of Michigan)

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Jeudi 7 avril / Thursday, April 7
Centre de recherches mathématiques
Pavillon André-Aisenstadt, Universite de Montreal
Salle / Room 5340

14:30 / 2:30 pm

"Threshold dynamics for networks with arbitrary surface tensions"

Threshold dynamics, also known as diffusion generated motion, is a miraculously simple and extremely efficient algorithm for evolving surfaces, including networks of them, via mean curvature motion and related flows. It was proposed by Merriman, Bence, and Osher in 1992. Its efficiency stems from how it generates the entire dynamics, including the relevant conditions at free boundaries known as junctions (along which three or more surfaces meet) by merely alternating two simple and fast operations: Convolution with a kernel, and thresholding.

The original algorithm applies only to networks in which the surface area of each interface is isotropic and is weighted equally. Extending the algorithm to the more general setting in which the surface area of each interface is weighted by a possibly different constant (known as surface tension) remained elusive. I will describe how to extend threshold dynamics to this level of generality, which is required by materials scientists, while maintaining its extreme simplicity and efficiency. The key is a new, variational formulation of the original algorithm. This is joint work with Felix Otto.

Pause-café / Coffee Break
15h30 / 3:30 pm

16h00 / 4:00 pm

"Threshold dynamics for anisotropic surface energies"

Extending threshold dynamics to anisotropic surface energies -- where the surface tension depends on the direction of the normal to the interface -- has been extensively studied, starting with the original paper of Merriman, Bence, and Osher in 1992. Yet many questions remain, such as the class of anisotropies that can be handled by this approach. A new, variational formulation of the basic threshold dynamics algorithm sheds new light on these questions.

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http://www.crm.math.ca/Esedoglu

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