JOINT

NUMERICAL METHODS FOR PDES SEMINAR

and

PHYSICAL MATHEMATICS SEMINAR

Where do rivers grow?
Path selection and growth in a harmonic field

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ABSTRACT:

River networks exhibit a complex ramified structure that has inspired decades of studies. Yet, an understanding of the propagation of a single stream remains elusive. Here we invoke a criterion for path selection from fracture mechanics and apply it to the growth of streams in a diffusion field. We show that a stream will follow local symmetry in order to maximize the water flux and that its trajectory is defined by the local field in its vicinity. We also study the growth of a real network. We use this principle to reconstruct the history of a network and to find a growth law associated with it. The results show that the deterministic growth of a single channel based on its local environment can be used to characterize the structure of river networks.

Wednesday, November 12, 2014
4:30 PM - 5:30 PM
Building E17, Room 129

http://math.mit.edu/seminars/nmpde/

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