What is CoMe?

CoMe is the name for a seminar series. It is born with the philosophy of being an open lunchtime meeting for PhD students, professors and applied mathematics enthusiasts from everywhere. Join us and share a delicious snack followed by a first class seminar talk surrounded by a friendly atmosphere of learning and discussion.

Next Meeting:
Friday, September 14, 2012
13.30h

Location:
Room 212, C2 Building
Campus Nord UPC

XV CoMe Seminar:

Mathematical Challenges of Using Video Force Microscopy (VFM) to Estimate the Forces That Drive Cell and Tissue Motions in Embryos

By G. Wayne Brodland
(University of Waterloo)

Abstract

Video Force Microscopy (VFM) is a new technique whose goal is to determine the forces that drive cell and tissue motions in embryos based on their observed motions. It is related to elastography and other inverse methods in mechanics. When applied to the ring-like cross-section of drosophila embryos, VFM is able to obtain considerable information about the forces that drive ventral furrow formation. When applied to cell sheets (epithelia) that carry unknown far field stresses, rank deficiency can arise and additional mathematical challenges must be addressed. The talk will explore how edge, area and boundary forces interact mathematically and some of the computational approaches that can be used to improve solution reliability. Applications will include morphogenetic tissue movements, wound healing and cell sorting. The latter involves a pipeline from confocal images to traced images to 3D reconstructions to finite element models to 3D VFM equations and solutions.

Please check further information at www.lacan.upc.edu

Contact us:
Feel free to leave us your doubts and suggestions at come.seminars@upc.edu