INSTITUTE FOR PURE AND APPLIED MATHEMATICS

Los Angeles, California

IMAGE PROCESSING FOR RANDOM SHAPES: APPLICATIONS TO BRAIN MAPPING, GEOPHYSICS AND ASTROPHYSICS

May 21 – May 25, 2007

ORGANIZING COMMITTEE: PETER JONES, CHAIR (YALE UNIVERSITY), **FREDERIC DIAS** (ÉCOLE NORMALE SUPÉRIEURE DE CACHAN), **STANLEY OSHER** (UCLA), **GUILLERMO SAPIRO** (UNIVERSITY OF MINNESOTA, TWIN CITIES), **JEAN-LUC STARCK** (COMMISSARIAT À l'ÉNERGIE ATOMIQUE (CEA)), **PAUL THOMPSON** (UCLA), **KEITH WORSLEY** (McGILL UNIVERSITY)

Scientific Overview

Random shapes occur in many physical and biological models and applications, and image processing of these random shapes is very challenging. This workshop will bring together experts in image processing, mathematics, biology and medicine, and physical sciences. Topics discussed in the workshop include, but are not limited to: brain imaging and measures of complexity; random fields in brain science; complexity in cortex or brain morphology; shrinking and wrinkling of anatomical structures; filaments and large scale structures in the cosmos; random fields; geometry and the Gaussian free field; distribution of dark matter; 3D image processing and graphics for complex surfaces in the geophysical sciences; computational geometry for complex sets and surfaces.

Confirmed Speakers

Moo Chung (University of Wisconsin-Madison), **Ronald Coifman** (Yale University), **Frederic Dias** (École Normale Supérieure de Cachan), **Gloria Haro** (University of Minnesota, Twin Cities), **Monica Hurdal** (Florida State University), **Sarang Joshi** (University of Utah), **Marc Lachieze-Rey** (Commissariat à l'Énergie Atomique), **Jason Lerch** (McGill University), **Jean-Francois Mangin** (Commissariat à l'Énergie Atomique), **Vicent Martinez** (University of Valencia), **Larry Mayer** (University of New Hampshire), **Francois Meyer** (University of Colorado, Boulder), **Michael Miller** (Johns Hopkins University), **Stanley Osher** (UCLA), **Naoki Saito** (UC Davis), **Guillermo Sapiro** (University of Minnesota, Twin Cities), **Sergei Shandarin** (University of Kansas), **Jean-Luc Starck** (Commissariat à l'Énergie Atomique), **Jonathan Taylor** (Stanford University), **Paul Thompson** (UCLA), **Rien van de Weygaert** (Rijksuniversiteit te Groningen), **Namrata Vaswani** (Iowa State University), **Kevin Vixie** (Los Alamos National Laboratory), **Keith Worsley** (McGill University), **Shing-Tung Yau** (Harvard University).

Long Program Schedule

This workshop is part of the long program "Random Shapes."
• Tutorials, March 13-16, 2007
• Workshop 1: Random Shapes, Representation Theory, and Conformal Field Theory, March 26-30, 2007
• Workshop 2: Random Curves, Surfaces, and Transport, April 16-20, 2007
• Workshop 3: Random and Dynamic Graphs and Networks, May 7-11, 2007
• **Workshop 4: Image Processing for Random Shapes: Applications to Brain Mapping, Geophysics and Astrophysics, May 21-25, 2007**

Participation

Additional information about this workshop including links to register and to apply for funding, can be found on the webpage listed below. Encouraging the careers of women and minority mathematicians and scientists is an important component of IPAM's mission, and we welcome their applications.

www.ipam.ucla.edu/programs/rsws4

IPAM is an NSF funded institute

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