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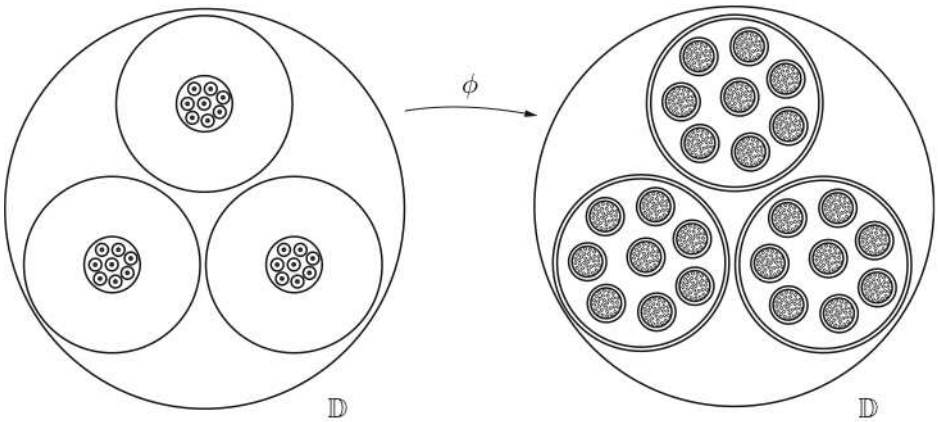
ESF Conference in Partnership with EMS and ERCOM

Harmonic Analysis, Geometric Measure Theory and Quasiconformal Mappings

Centre de Recerca Matemàtica, Bellaterra • Spain
14-20 June 2009

Chair: **Prof Pertti Mattila,** University of Helsinky, Finland

www.esf.org/conferences/09308



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Preliminary Programme

The purpose of the conference is to provide researchers working in harmonic analysis, quasiconformal mappings or geometric measure theory with a scientific event designed to promote a deep interaction between the three subjects. When the theory of quasiconformal mappings reached some maturity, its strong relation to real analysis (in particular to Calderón-Zygmund theory, through its connection with the Beurling transform) became apparent. In the past two decades one has realised that this relation is even more intimate than it was expected, through the work on area distortion, connection with PDEs etc. In particular, area distortion is related to the precise value of the norm of the Beurling transform as an operator on Lp, and this has lead to connections with probability theory (martingales) and control theory (the Bellman function). On the other hand, the mapping properties of Calderón-Zygmund operators of last generation, in which the underlying measure is a rather general measure on Euclidean space, has shown to be intimately connected to rectifiability (uniform rectifiability) and thus to geometric measure theory. Recently a new connection between geometric measure theory and quasiconformal mappings has also emerged, when studying removability problems for quasiregular functions. The main goal of the conference is to bring together the leading worldwide experts in each of the subjects listed above and young researchers, including postdocs and advanced doctoral students working in related topics. One expects that new perspectives will arise, new problems will be raised and new light will be shed on old open problems. The themes dealt with in the conference will be:

1. New developments on distortion of sets under quasiconformal mappings (Lacey, Sawyer, Uriarte)
2. Quasiconformal mappings and PDE, in particular the Calderón inverse problem (Astala, Faraco, Iwaniec, Päivärinta, Zhong)
3. Removability and quasiconformal mappings (Astala, Clop, Mateu, Orobitg, Tolsa)
4. Functions of finite distortion and hyperelastic deformations (David, Iwaniec, Koskela, Saksman)
5. Metric measure spaces, Poincaré's inequality and harmonic functions (Hajlasz, Koskela, Zhong)

Invited Speakers will include

- **Kari Astala**
  University of Helsinki, Finland
- **Pascal Auscher**
  Université de Paris XI (Paris-Sud), France
- **Rodrigo Bañuelos**
  Purdue University, USA
- **Luca Capogna**
  University of Arkansas, USA
- **Csornyei Marianna**
  University College London, UK
- **Guy David**
  Université de Paris Sud, France
- **Daniel Faraco**
  Universidad Autónoma de Madrid, Spain
- **John B. Garnett**
  University of California at Los Angeles, USA
- **Piotr Hajlasz**
  University of Pittsburgh, USA
- **Alex Iosevich**
  University of Missouri-Columbia, USA
- **Tadeusz Iwaniec**
  Syracuse University, USA
- **Loredana Lanzani**
  University of Arkansas, USA
- **Gaven Martin**
  Institute for information and mathematical sciences - Massey University, New Zealand
- **Jani Onninen**
  Syracuse University, USA
- **Eero Saksman**
  University of Helsinki, Finland
- **László Székelyhidi**
  Hausdorff center for mathematics - Universität Bonn, Germany
- **Tatiana Toro**
  University of Washington, USA
- **Rodolfo Torres**
  University of Kansas, USA
- **Alexander Volberg**
  Michigan State University, USA
- **Xiao Zhong**
  Jyväskylä Universitet, Finland