

Advanced Course on Integral Geometry and Valuation Theory

Centre de Recerca Matemàtica
Bellaterra, Barcelona

6 - 10 September 2010

In the last decade, there was significant progress in the theory of valuations on convex sets. This has originated a new approach and important developments of integral geometry in the sense of Blaschke, Chern and Santaló. The aim of this Advanced Course is to report on this recent progress, providing an introduction to both

valuation theory and integral geometry from a modern viewpoint. There will be two main courses, complemented by several invited and contributed talks. This event is addressed to graduate students, postdocs and interested researchers from any field.

Lecturers

SEMYON ALESKER, Tel Aviv University

New structures on valuations and applications

Abstract: In the first part of the lectures we discuss translation invariant valuations on convex sets. Starting with the irreducibility theorem, we discuss the product and the Fourier transform on valuations and their properties. In the second part of the lectures we discuss the notion of valuation on manifolds. We extend the product construction to this case, study functorial properties, and introduce a general Radon type transform on valuations. Then we discuss applications of these constructions to more classical problems of integral geometry.

JOSEPH FU, University of Georgia

Algebraic integral geometry

Abstract: Building on the fundamental new structures introduced by Alesker, we show how to recast, in simple algebraic terms, the conceptual and computational structure of the classical integral geometry initiated by Blaschke in the 1930s. From this point of view, the classical case, centered on the special orthogonal group, appears as the trivial ground case of a more general theory about the integral geometry of arbitrary compact Lie groups that act transitively on spheres. The first nontrivial case is that of "Hermitian integral geometry" (i.e. the integral geometry of the unitary group), in which Bernig and the author have made substantial inroads.

Invited Speakers

Juan-Carlos Álvarez Paiva
Andreas Bernig
Luis M. Cruz-Orive
Daniel Hug

Université des Sciences et Technologies de Lille
Johann Wolfgang Goethe-Universität Frankfurt
Universidad de Cantabria
Karlsruhe Institute of Technology

Coordinators

Eduard Gallego
Ximo Gual
Gil Solanes
Eberhard Teufel

Universitat Autònoma de Barcelona
Universitat Jaume I
Universitat Autònoma de Barcelona
Universität Stuttgart

Registration and Grants

Participants may apply for a reduced registration fee and lodging grants

Deadline for abstract submission: May 30, 2010

Deadline for grant applications: May 30, 2010

Deadline for registration and payment: July 1, 2010

Information

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