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[Main Page](#)

Convex Relaxation Methods for Geometric Problems in Scientific Computing

[Program
Poster PDF](#)

February 11 - 15, 2013

[Lodging & Air
Travel](#)

[Organizing Committee](#) | [Scientific Overview](#) | [Speaker List](#)

[Application/Registration](#) | [Contact Us](#)

**Schedule and
Presentations**

Organizing Committee

Xavier Bresson (City University of Hong Kong)
Antonin Chambolle (École Polytechnique)
Tony Chan (Hong Kong University of Science and Technology)
Daniel Cremers (Technische Universität München)
[Stanley Osher](#) (University of California, Los Angeles (UCLA))
Thomas Pock (Technische Universität Graz, Institute for Computer Graphics and Vision)
Gabriele Steidl (Universität Kaiserslautern)

[Back to Top](#)

Scientific Overview

Convex relaxation methods are studied and applied within a variety of disciplines in computer science and mathematics. They aim at providing exact or tight approximations of solutions of difficult problems. In the last few years, they have played a major role in designing efficient algorithms for compressed sensing and level set method. In addition to the substantial impact of convex relaxation methods in applied areas, they also are connected to various branches of mathematical sciences including optimization, functional analysis, geometry, graph theory and combinatorics.

The goal of this workshop is to bring together an interdisciplinary community from mathematics, computer vision, engineering and machine learning to discuss the latest progress and highlight various mathematical questions and algorithmic challenges.

The workshop will discuss the following topics:

- connections between convex relaxation methods and nonsmooth/nonlinear optimization algorithms based on L^1 and total variation
- relationships between graph theory, combinatorial and continuous optimizations via convex relaxation techniques
- relaxation methods to spectral and inference data models in machine learning
- opportunities of convex relaxation techniques for novel applications in signal processing, image processing, machine learning, computer vision, and graph theory

This workshop will include a poster session; a request for posters will be sent to registered participants in advance of the workshop.

[Back to Top](#)

Confirmed Speakers

Francis Bach (Institut National de Recherche en Informatique Automatique (INRIA))
Amir Beck (Technion - Israel Institute of Technology)
Yuri Boykov (University of Western Ontario)
Xavier Bresson (City University of Hong Kong)
Tony Chan (Hong Kong University of Science and Technology)
Daniel Cremers (Technische Universität München)
Jerome Darbon (University of California, Los Angeles (UCLA))
Christine De Mol (Université Libre de Bruxelles)
Selim Esedoglu (University of Michigan)
Matthias Hein (Saarland University)
Nikos Komodakis (University of Crete)
Mila Nikolova (École Normale Supérieure de Cachan)

Stanley Osher (University of California, Los Angeles (UCLA))
Gabriel Peyre (Université de Paris IX (Paris-Dauphine))
Thomas Pock (Technische Universität Graz)
Massimiliano Pontil (University College London)
Christoph Schnörr (University of Heidelberg)
Carola Schoenlieb (University of Cambridge)
Simon Setzer (Saarland University)
Gabriele Steidl (Universität Kaiserslautern)
Xue-Cheng Tai (University of Bergen)
Luminita Vese (University of California, Los Angeles (UCLA))
Martin Vetterli (École Polytechnique Fédérale de Lausanne (EPFL))

[Back to Top](#)

Application/Registration

An application/registration form is available at:

<http://www.ipam.ucla.edu/elements/choose.aspx?pc=crm2013>

The **application** form is for those requesting financial support to attend the workshop. We urge you to apply as early as possible. Applications received by Tuesday, December 17, 2013 will receive fullest consideration. Letters of reference may be sent to the address or email address below. Successful applicants will be notified as soon as funding decisions are made. If you do not need or want to apply for funding, you may simply **register**. IPAM will close registration if we reach capacity; for this reason, we encourage you to register early.

We have funding especially to support the attendance of recent PhD's, graduate students, and researchers in the early stages of their career; however, mathematicians and scientists at all levels who are interested in this area are encouraged to apply for funding. Encouraging the careers of women and minority mathematicians and scientists is an important component of IPAM's mission and we welcome their applications.

[Back to Top](#)

Contact Us:

Institute for Pure and Applied Mathematics (IPAM)
Attn: CRM2013
460 Portola Plaza
Los Angeles CA 90095-7121
Phone: 310 825-4755
Fax: 310 825-4756
Email: crm2013@ipam.ucla.edu
Website: <http://www.ipam.ucla.edu/programs/crm2013/>

[Back to Top](#)