



## NCMIP 2013

### 3<sup>rd</sup> International Workshop on New Computational Methods for Inverse Problems Institut Farman, Ecole Normale Supérieure de Cachan, Cachan, France May 22, 2013

#### Call for paper

**Scope:** The New Computational Methods for Inverse Problems (NCMIP) Workshop focuses on recent advances in the resolution of inverse problems. Inverse problems appear in numerous scientific areas such as geophysics, biological and medical imaging, material and structure characterization, electrical, mechanical and civil engineering, and finances... The resolution of inverse problems consists of estimating the parameters of the observed system or structure from data collected by an instrumental sensing or imaging device. Its success firstly requires the collection of relevant observation data. It also requires accurate models describing the physical interactions between the instrumental device and the observed system, as well as the intrinsic properties of the solution itself. Finally, it requires the design of robust, accurate and efficient inversion algorithms. Advanced sensor arrays and imaging devices provide high rate and high volume data; in this context, the efficient resolution of the inverse problem requires the joint development of new models and inversion methods, taking computational and implementation aspects into account. During this one-day workshop, researchers will have the opportunity to bring to light and share new techniques and results in the field of inverse problems.

**Topics:** Topics of interest are mostly related to algorithmic and mathematical aspects of inverse problems, as well as applications in the domain of waves. The topics include, but are not limited to the following items: Algorithms and computational aspects of inversion, Bayesian estimation, Kernel methods, Learning methods, Convex optimization, Free discontinuity problems, Metamodels, Proper orthogonal decomposition, Reduced models for the inversion, Non-linear inverse scattering, Image reconstruction and restoration, Applications (bio-medical imaging, non-destructive evaluation...).

**About the workshop:** NCMIP 2013 is the third edition of the workshop. The first edition took place in Cachan, France, in the scope of ValueTools in May 2011 (<http://www.ncmip.org/2011/>). The second edition took place in Cachan, in May 2012, at *Institut Farman* ([http://www.farman.ens-cachan.fr/NCMIP\\_2012.html](http://www.farman.ens-cachan.fr/NCMIP_2012.html)). As in those past editions, NCMIP 2013 will be a one-day workshop during which oral presentations will be given by authors of accepted papers and by three international invited speakers.

#### Invited talks:

- **Jérôme Idier**, IRCCyN (UMR CNRS 6597), Ecole Centrale de Nantes, France  
"Majorize-Minimize stepsize strategies for image restoration"
- **Massimo Fornasier**, Faculty of Mathematics, Technical University of Munich, Germany  
"Linearly constrained nonsmooth and nonconvex minimization"
- **Matthias Fink**, Institut Langevin, ESPCI, Université Paris Diderot, France  
"Time-reversal and diffraction limit"

**Important dates:**

Submission of (4 to 6 pages) papers: February 15, 2013

Notification of Acceptance: April 19, 2013

Workshop Date: May 22, 2012

**Registration:** The registration to NCMIP 2013 is free, but is mandatory. Registration instructions will be given in due time.

**Workshop co-chair:**

Laure Blanc-Féraud, I3S laboratory and INRIA Nice Sophia-Antipolis, France

Pierre-Yves Joubert, IEF, Paris-Sud University, CNRS, France

**Technical program committee:**

Gilles Aubert, J-A Dieudonné Laboratory, CNRS and University of Nice-Sophia Antipolis, France

Nabil Anwer, LURPA, ENS Cachan, France

Alexandre Baussard, ENSTA Bretagne, Lab-STICC, France

Marc Bonnet, ENSTA, ParisTech, France

Antonin Chambolle, CMAP, Ecole Polytechnique, CNRS, France

Oliver Dorn, School of Mathematics, University of Manchester, UK.

Gérard Favier, I3S Laboratory, University of Nice Sophia-Antipolis, France

Mário Figueiredo, Instituto Superior Técnico, Lisbon, Portugal.

Laurent Fribourg, LSV, ENS Cachan, CNRS, France

Marc Lambert, L2S Laboratory, CNRS, SupElec, Paris-Sud University, France

Dominique Lesselier, L2S Laboratory, CNRS, SupElec, Paris-Sud University, France

Matteo Pastorino, DIBE, University of Genoa, Italy

Christian Rey, LMT, ENS Cachan, CNRS, France

Simon Setzer, Saarland University, Germany

Cedric Vonesch, EPFL, Switzerland

**Local chair:**

Sophie Abriet, SATIE Laboratory, ENS Cachan, France

Béatrice Bacquet, SATIE Laboratory, ENS Cachan, France

**Publication of the workshop proceedings:**

Submitted papers will be peer reviewed and accepted papers will be published by IOP publishing "Journal of Physics: Conference Series" both on-line and in a printed volume.

**Web site:** [http://www.farman.ens-cachan.fr/NCMIP\\_2013.html](http://www.farman.ens-cachan.fr/NCMIP_2013.html) (on line soon)