

# CALL FOR PAPERS

## NCMIP 2014

4th International Workshop  
on New Computational Methods for Inverse Problems

Institut Farman,  
Ecole Normale Supérieure de Cachan  
Cachan, FRANCE

May 23, 2014

Submission deadline, February 16, 2014

The registration to NCMIP 2014 is free



The workshop is endorsed by the following research network:



**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 2014 is the fourth 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 and third editions took place in Cachan, in May 2012 and May 2013, at *Institut Farman* ([http://www.farman.ens-cachan.fr/NCMIP\\_2012.html](http://www.farman.ens-cachan.fr/NCMIP_2012.html) [http://www.farman.ens-cachan.fr/NCMIP\\_2013.html](http://www.farman.ens-cachan.fr/NCMIP_2013.html)). As in those past editions, NCMIP 2014 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:

- **Andrea Massa**, Università di Trento, Italy.
- **Gabriel Peyre**, Ceremade laboratory, University of Paris Dauphine, France.
- **Jean-Yves Tournieret**, IRIT laboratory, ENSEEIHT (Toulouse), France.