STEFAN BANACH INTERNATIONAL MATHEMATICAL CENTER



SIXTH EU FRAMEWORK PROGRAMME TRANSFER OF KNOWLEDGE TODEQ OPERATOR THEORY METHODS FOR DIFFERENTIAL EQUATIONS

Warsaw, 14 May -25 May

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Regularization methods for ill-posed problems of analysis and statistics

a minicourse (12 hours)

Description

Ill-posed equations arise frequently in the context of inverse problems, where it is the aim to determine unknown characteristics of the underlying process from the data corrupted by measurement noise. When such noise is assumed to be random, this is a problem of statistical estimation. When it is assumed to be chosen, not at random, but by an antagonistic opponent, this is a problem of optimal recovery. While the two problems are superficially different, there is a number of underlying similarities, and the results obtained for one problem may be exploited for the other. It is the aim of the course to discuss a general approach to regularization of ill-posed problems for deterministic as well as for stochastic noise models.

Plan:

- 1) Examples for motivation: Numerical differentiation, Cauchy problem for Elliptic Equations, Natural linearization for parameter identification.
- 2) Essentially ill-posed linear operator equations. A general view of the problem of regularization.
- 3) The best possible accuracy for stochastic and deterministic noise models.
- 4) Balancing principle for an adaptive regularization and its extension.
- 5) Applications and Discussions.

The course is addressed mainly to mathematicians interested in modern applied mathematics. There is no registration fee. We offer free lodging at the Banach Center for a limited number of participants and arrange a cheap accommodation for others.

More details at http://www.impan.gov.pl/BC/Program/conferences/ill-posed-problems.html

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