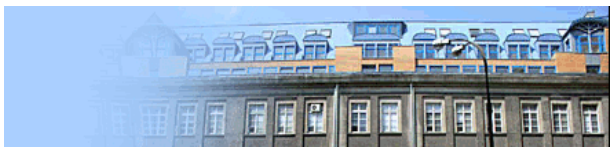
STEFAN BANACH
INTERNATIONAL MATHEMATICAL
CENTER



SIXTH EU FRAMEWORK PROGRAMME TRANSFER OF KNOWLEDGE - SPADE2 and TODEQ

Inverse and Ill-Posed Problems

26 – 28 March 2008

Lectures by

Andreas Neubauer

Industrial Mathematics Institute, Johannes Kepler University, Linz, Austria

Professor Andreas Neubauer will read lectures at the Stefan Banach International Mathematical Center in Warsaw, ul Śniadeckich 8, hall 403. The course consists of 5 blocks, 100 min. each.

Program of the session

Wednesday, March 26,

16:00 – 18:00 - Introduction into ill-posed problems
- Basics on the Moore Penrose Generalized Inverse, Singular Value Expansion and the Spectral Theory

Thursday, March 27

10:00 – 12:00 - Continuous Regularization Methods
- A Priori and A Posteriori Parameter Selection Methods
- Tikhonov Regularization

12:15 – 13:00 - Communications by participants: Anna Mosentsova and Evgeniy Volynets

16:00 – 18:00 - Numerical Realization (also of a posteriori choices)
- Iterative Regularization Methods
- Tikhonov Regularization for Nonlinear Equations

18:15 - Conference dinner

Friday, March 28

10:00-12:00 - Iterative Regularization Methods for Nonlinear Equations

15:00 – 17:00 - Adaptive Grid Regularization

Inverse problems are concerned with determining causes for a desired or an observed effect. Inverse problems most often do not fulfill Hadamard's postulates of *well-posedness*. Thus, they might not have a solution in the strict sense, solutions might not be unique and/or might not depend continuously on the data. A consequence is that arbitrarily small changes in the data may lead to arbitrarily large changes in the solution. As in the numerical treatment of inverse problems data errors are inevitable, one has to use stabilizing procedures for successfully dealing with ill-posed problems, so-called *regularization methods.*