

# Copper Country Summer Workshop on Numerical Analysis and Inverse Problem

*On occasion of the 70th birthday of Prof. David Colton*

Michigan Tech. Houghton, MI, Aug. 12-14, 2013

## Monday, Aug. 12, 2013

- 8:30am - 8:50am, Registration
- 8:50am - 9:00am, Opening Remarks, Mark Gockenbach
- 9:00am - 10:20am, Plenary Talks. Chair: Peter Monk
  - 9:00am - 9:40am, Susanne Brenner,  $C^0$  interior penalty methods
  - 9:40am - 10:20am, Plamen Stefanov, *The identification problem in SPECT-theory and numerics*
- 10:20am - 10:40am, Coffee Break
- 10:40am - 12:00pm, Invited Talks. Chair: Weimin Han
  - 10:40am - 11:00am, Xiu Ye, *An introduction of new finite element methods: Weak Galerkin methods*
  - 11:00am - 11:20am, Constantin Bacuta, *A Cascadic Algorithm for Saddle Point Problems*
  - 11:20am - 11:40am, Jintao Cui, *A Nonconforming Finite Element Method for an Acoustic Fluid-Structure Interaction Problem*
  - 11:40am - 12:00pm, Li-yeng Sung,  *$P1$  Finite Element Methods for Two Dimensional Time Harmonic Maxwell Equations*
- 12:00pm - 2:00pm Lunch Break
- 2:00pm - 2:40pm, Plenary Talk. Chair: William Layton,
  - 2:00pm - 2:40pm, Weimin Han, *Variational Principles, A Posteriori Error Estimates and Differential Approximations in Radiative Transfer*
- 2:40pm - 3:40pm, Invited Talks. Chair: Di Liu
  - 2:40pm - 3:00pm, Peijun Li, *Near-Field Imaging of Infinite Rough Surfaces*
  - 3:00pm - 3:20pm, Hongyu Liu, *Locating multiple multi-scale electromagnetic scatterers*
  - 3:20pm - 3:40pm, Kui Ren, *Inverse coefficient problem for transport in stochastic environments*
- 3:40pm - 4:00pm, Coffee Break
- 4:00pm - 5:00pm, Invited Talks. Chair: Peijun Li
  - 4:00pm - 4:20pm, Chunxiong Zheng, *Global geometrical optics approximation to the high frequency Helmholtz equation in discontinuous medium*

- 4:20pm - 4:40pm, Gerard Awanou, *Standard Lagrange elements for the numerical resolution of the Monge-Ampere equation*
- 4:40pm - 5:00pm, Mahadevan Ganesh, *A model reduction algorithm for efficient simulation of a class of parametrized 3D electromagnetic forward models*
- 5:00pm - 5:20pm, Hengguang Li, *Regularity and Multigrid Analysis for Laplace-Type Axisymmetric Equations*
- 6:00pm - 8:00pm, Workshop Banquet

## Tuesday, Aug. 13, 2013

- 9:00am - 9:40am, Plenary Talks. Chair: Susanne Brenner
  - 9:00am - 9:40am, William Layton, *Algorithms for calculation of flow ensembles*
  - 9:40am - 10:20am, Fioralba Cakoni, *Transmission Eigenvalues in Inverse Scattering Theory*
- 10:20am - 10:40am, Coffee Break
- 10:40am - 12:00pm, Invited Talks. Chair: John Scotland
  - 10:40am - 11:00am, Xia Ji, *A Multi-Level Method for Transmission Eigenvalues of Anisotropic Media*
  - 11:00am - 11:20am, Allan Struthers, *Contour Integral Based Algorithms for Interior Transmission Eigenvalues*
  - 11:20am - 11:40am, Yukun Guo, *A time domain approach to the linear sampling method*
  - 11:40am - 12:00pm, Andriy Synyavskyy, *A linear sampling method for visualization of the boundary of an impenetrable object using near-field scattering data*
- 12:00pm - 2:00pm Lunch Break
- 2:00pm - 2:40pm, Plenary Talk. Chair: Plamen Stefanov
  - 2:00pm - 2:40pm, John Scotland, *TBD*
- 2:40pm - 3:40pm, Invited Talks. Chair: Haomin Zhou
  - 2:40pm - 3:00pm, Mark Stiff, *Approaches to some non-linear inverse problems, motivated by ranging remote sensing methods*
  - 3:00pm - 3:20pm, Jingfang Jiang, *Forward and Inverse Problems in Ultrasound-based Quantitative Palpation Imaging*
  - 3:20pm - 3:40pm, Bilal Chanane, *Boundary Control of Nonlinear Parabolic Equation*
- 3:40pm - 4:00pm Coffee Break
- 4:00pm - 5:20pm, Invited Talks. Chair: Hongyu, Liu
  - 4:00pm - 4:20pm, Haomin Zhou, *An Efficient Numerical Methods for Inverse Source Problems with Applications in Fluorescence Tomography*
  - 4:20pm - 4:40pm, Wenyuan Liao, *Solving full-waveform inversion problem through PDE-constrained optimization*
  - 4:40pm - 5:00pm, Sum Chow, *Numerical solutions to scattering problems*
  - 5:00pm - 5:20pm, Di Liu, *Multiscale modeling and computation of nano optical responses*

## Wednesday, Aug. 14, 2013

- Plenary Talk. Chair: Fioralba Cakoni
  - 9:00am - 9:40am, Jijun Liu, *Total variation regularization for backward time-fractional diffusion problem*
- 9:40am - 10:40am, Invited Talks. Chair: Chunxiong Zheng
  - 9:40am - 10:00am, Wenjun Ying, *A kernel-free boundary integral method for Elliptic PDEs*
  - 10:00am - 10:20am, Yang Yang, *Discontinuous Galerkin method for hyperbolic equations involving  $\delta$ -singularities*
  - 10:20am - 10:40am, Liwei Xu, *Variational Methods for the Fluid-Structure Interaction Problem*
- 10:40am - 11:00am, Coffee Break
- 11:00am - 12:00pm, Invited Talks. Chair: Zhengfu Xu
  - 11:00am - 11:20am, Yulong Xing, *Energy conserving discontinuous Galerkin methods for the wave propagation problems*
  - 11:20am - 11:40am, Tong Sun, *Numerical smoothness for PDE error analysis*
  - 11:40am - 12:00pm, Xiaoming He, *Parallel, non-iterative, multi-physics domain decomposition methods for time-dependent Stokes-Darcy system*