

## Inverse Problems Workshop Series I

**Thursday October 16, 2003**

- 1:00 *seg1|Deconvolution and Related Inverse Problems in the Physical Sciences*
- 8:30–9:00 *Check-In/Light Breakfast (Hosted by IPAM)*
- 9:00–10:00 **David Colton** (University of Delaware)  
*Tutorial: The Direct Scattering Problem for an Infinite Cylinder*
- 10:00–10:30 *Break*
- 10:30–12:00 **Mario Bertero** (Univ of Genova, Italy)  
*Tutorial: Image deconvolution*
- 12:00–2:00 *Lunch (on your own)*
- 2:00–2:10 *Welcome and Opening Remarks*
- 2:10–3:10 **Pierre Sabatier** (Université de Montpellier II)  
*What did we learn and still may learn from Inverse Scattering?*
- 3:10–3:40 *Break*
- 3:40–4:40 **David Colton** (University of Delaware)  
*Inverse Scattering Problems for Electromagnetic Waves*
- 4:40–5:40 **Robert Anderssen** (CSIRO, Australia)  
*Inverse Problems in Rheology - Rheological Implications of Completely Monotone Fading Memory*
- 5:45–7:00 *Wine/Cheese Reception (Hosted by IPAM)*

**Friday October 17, 2003**

- 1:00 *seg1|Deconvolution and Related Inverse Problems in the Physical Sciences*
- 8:30–9:00 *Continental Breakfast*
- 9:00–10:00 **Kuo-Nan Liou** (UCLA)  
*Remote Sensing of Three-Dimensional and Inhomogeneous Cirrus Clouds in the Earth's Atmosphere*
- 10:00–10:30 *Break*

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- 10:30–11:30 **Moustafa T. Chahine** (Jet Propulsion Laboratory)  
*Inverse problems in remote sensing of planetary atmospheres*
- 11:30–12:30 **Willi Freeden** (Universitaet Kaiserslautern)  
*Inverse Problems in Geosciences: Regularization of Satellite Data by Multiresolution Analysis*
- 12:30–2:30 *Lunch (on your own)*
- 2:30–3:30 **Keith Hege** (MKS Imaging Technology, LLC)  
*Indirect imaging problems in astronomy and surveillance*
- 3:30–4:00 *Break*
- 4:00–5:00 **Charles Matson** (USAF/Kirtland)  
*Diffraction tomography and blind deconvolution for imaging in turbid media*

### **Saturday October 18, 2003**

- 1:00 *seg1|Deconvolution and Related Inverse Problems in the Physical Sciences*
- 8:30–9:00 *Continental Breakfast*
- 9:00–10:00 **Jose-Angel Conchello** (Oklahoma Medical Research Foundation)  
*What's wrong with this picture? An overview of inverse methods for three-dimensional microscopy*
- 10:00–10:30 *Break*
- 10:30–11:30 **Edward Pike** (King's College, London)  
*Inverse problems in laser scanning microscopy and optical digital storage discs*
- 11:30–12:30 **Sylvain Baillet** (Cognitive Neuroscience & Brain Imaging Laboratory)  
*Exploring brain functions with high-temporal resolution: models and methods in electromagnetic brain imaging*
- 12:30–12:00 *Conclusion*

### **Monday October 20, 2003**

- 1:00 *seg2|Emerging Applications of Inverse Problems Techniques to Imaging Science*
- 8:30–9:00 *Check-In/Light Breakfast (Hosted by IPAM)*
- 9:00–10:00 **Yoram Bresler** (University of Illinois at Urbana-Champaign)  
*Fast Hierarchical Algorithms for Tomography*
- 10:00–10:30 *Break*

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- 10:30–11:30 **Oliver Dorn** (Universidad Carlos III de Madrid)  
*On the use of level sets for two selected inverse problems*
- 11:30–12:30 **Marc Droske** (University Duisburg)  
*A Variational Approach to non-rigid morphological image registration*
- 12:30–2:00 *Lunch (on your own)*
- 2:00–3:00 **Alexander Katsevich** (University of Central Florida)  
*Efficient image reconstruction in cone beam tomography*
- 3:00–4:00 **Haomin Zhou** (Georgia Institute of Technology)  
*Variational PDE Techniques in Wavelet Based Image Compression*
- 4:00–4:30 *Break*
- 4:30–5:30 **Brent Ellerbroek** (National Optical Astronomical Observatory)  
*Applications of Linear Inverse Problem Techniques to Real-Time Adaptive Optics*

## **Tuesday October 21, 2003**

- 1:00 *seg2|Emerging Applications of Inverse Problems Techniques to Imaging Science*
- 8:30–9:00 *Continental Breakfast*
- 9:00–10:00 **Sudhakar Prasad** (University of New Mexico)  
*Phase Diverse Speckle Imaging and Information Based Optimization*
- 10:00–10:30 *Break*
- 10:30–11:30 **David Tyler** (University of Arizona)  
*The use of angular support and adaptive optics phase information in image deconvolution*
- 11:30–12:30 **Otmar Scherzer** (University of Innsbruck)  
*Denoising methods for imaging*
- 12:30–2:00 *Lunch (on your own)*
- 2:00–3:00 **Tony Chan** (UCLA)  
*Geometric and Total Variation Regularization for Imaging and Tomography Problems*
- 3:00–4:00 **John Schotland** (University of Pennsylvania)  
*Inverse Scattering and the Optical Theorem*
- 4:00–4:30 *Break*
- 4:30–5:30 **Robert Plemmons** (Wake Forest University)  
*Integrated Optical-Digital Approach for Enhancing Image Restoration*
- 5:30–7:00 *Dinner (Hosted by IPAM)*

## Wednesday October 22, 2003

- 1:00 *seg3|Inverse Problems in the Life Sciences*
- 8:30–9:00 *Check-In/Light Breakfast (Hosted by IPAM)*
- 9:00–9:40 **Peter Schuster** (University of Vienna)  
*Inverse folding and sequence structure maps of ribonucleic acids (RNA)*
- 9:40–10:20 **Patrice Koehl** (Stanford University)  
*The Inverse Protein Folding Problem*
- 10:20–10:50 *Break*
- 10:50–11:30 **Garry Odell** (University of Washington)  
*The points set in high-dimensional parameter space for which a genetic network works is vast. Finding/describing it is a hard inverse problem.*
- 11:30–1:30 *Lunch (hosted by IPAM)*
- 1:30–2:10 **Oscar Bruno** (California Institute of Technology)  
*The inverse scattering problem for optical coherence tomography*
- 2:10–2:50 **Joyce McLaughlin** (Rensselaer Polytechnic Institute)  
*Creating images of shearwave speed variations in tissue using inverse problems methods*
- 2:50–3:20 *Break*
- 3:20–4:00 **Todd Yeates** (UCLA)  
*An introduction to the phase retrieval problem in protein crystallography*
- 4:00–4:40 **Niles Pierce** (California Institute of Technology)  
*Paradigms for Computational Nucleic Acid Design*

## Thursday October 23, 2003

- 1:00 *seg3|Inverse Problems in the Life Sciences*
- 8:30–9:00 *Continental Breakfast*
- 9:00–9:40 **Lisa J. Fauci** (Tulane University)  
*Integrative models of microorganism motility: what does a ciliary beat say about the cilium?*
- 9:40–10:20 **Liliana Ironi** (IMATI, Italy)  
*A hybrid approach to nonlinear metabolic system identification: a case study*
- 10:20–10:50 *Break*

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- 10:50–11:30 **Peter Deuffhard** (Freie Universität, Berlin)  
*Robust Perron Cluster Analysis in Conformation Dynamics*
- 11:30–1:30 *Lunch (on your own)*
- 1:30–2:10 **Steve Cox** (Rice University)  
*Eavesdropping on Synaptic Traffic*
- 2:10–2:50 **Scott Makeig** (University of California at San Diego)  
*Statistical approaches to EEG source inversion.*
- 2:50–3:20 *Break*
- 3:20–4:00 **Vincenzo Capasso** (University of Milan)  
*ON THE SOCIAL BEHAVIOUR OF BIOLOGICAL POPULATIONS*
- 4:00–4:40 **Robert Eisenberg** (Rush University)  
*Studying Ion Channels as an Inverse Problem*
- 4:40–5:00 *Conclusion*

