

PROCEEDINGS OF SPIE

# ***Image Reconstruction from Incomplete Data VII***

**Philip J. Bones  
Michael A. Fiddy  
Rick P. Millane**  
*Editors*

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- 4 Phase Retrieval and Deconvolution  
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## Introduction

Image Reconstruction from Incomplete Data VII (IRID7) was held on 14–15 August 2012. A total of 32 papers were accepted for presentation.

This conference continues those of the same name held at the SPIE Annual Meetings in San Diego in 2000, Seattle in 2002, Denver in 2004 and San Diego in 2006, 2008, and 2010. Conferences on this foundational topic of imaging and information recovery bring together researchers from a variety of different backgrounds to share their research advances and explore underlying commonalities. Breakthroughs and insights in one application area often have an impact on another. In all imaging problems, one is normally trying to extract as much information as possible from measured data that are limited, noisy, or corrupted somehow. Differences in governing equations or data acquisition techniques do not distract from the overarching similarities that always exist.

SPIE has a long history of supporting meetings with this theme, originally under the auspices of the Mathematical Imaging Program. Early meetings on this subject include Applications of Mathematics in Modern Optics (Vol. 358), chaired by W.H. Carter in 1981 at which 29 papers were presented and Inverse Optics I (Vol. 413), edited by A. J. Devaney in 1982 which had 30 papers.

This year's meeting was as stimulating as ever and maintained the diversity of topics and informal atmosphere of previous meetings. Sessions were divided into the following topics: Compressive Sensing and Sampling, Inverse Problems, Information from Projections and Microscopy, Phase Retrieval and Deconvolution, Coherent Diffraction Imaging, Coherent Diffraction Imaging, Interferometry, Compressive Sensing and Imaging, and Remote Sensing. We had four excellent invited speakers: Julian Maclaren from Stanford who spoke about optical motion tracking to diminish motion artefacts in high resolution MRI of the brain; Colin Fox of the University of Otago in New Zealand, talking about Gibbs-sampling and its equivalents for conductivity imaging and a wide range of other inverse problems; Chunhong Yoon from the European XFEL who spoke about novel reconstruction algorithms in x-ray coherent diffraction imaging; and Tim Cornwell from CSIRO in Australia who spoke about signal processing challenges and a new algorithm for wide-field imaging for the Square Kilometer Array. As in the past, the wide variety of backgrounds of those attending and the diverse applications presented were the conference's strength. Sharing common problems that arise in these different imaging applications areas again stimulated new ideas and collaborative opportunities, as well as feeding the intellectual challenges of cross-disciplinary research.

The chairs would like to thank the participants, authors, and the program committee members, for their part in making this meeting so successful. The

quality of the presentations was high and interactions between participants were enthusiastic as anticipated. Special thanks also go to the professional and efficient staff at SPIE for their assistance over the last year. We look forward to IRID-VIII in 2014.

**Philip J. Bones**  
**Michael A. Fiddy**  
**Rick P. Millane**