

CONTEMPORARY MATHEMATICS

559

Tomography and Inverse Transport Theory

International Workshop on Mathematical Methods
in Emerging Modalities of Medical Imaging
October 25–30, 2009, Banff, Canada

International Workshop on
Inverse Transport Theory and Tomography
May 16–21, 2010, Banff, Canada

Guillaume Bal
David Finch
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Dedicated to the memory of Professor Leon Ehrenpreis

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DIANE R. EAKER, STEVEN M. JORGENSEN, CONGWU CUI,
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Preface

The volume contains research and review articles written by participants of two related international workshops "Mathematical Methods in Emerging Modalities of Medical Imaging" (October 25–30, 2009, see <http://www.birs.ca/events/2009/5-day-workshops/09w5017>) and "Inverse Transport Theory and Tomography" (May 16–21, 2010, see <http://www.birs.ca/events/2010/5-day-workshops/10w5063>) that took place at the Banff International Research Station. These workshops brought together 64 mathematicians, physicists, engineers, and medical researchers from 10 countries working at the cutting edge of medical, geophysics, and industrial imaging research and addressed the demanding mathematical problems arising in this fast developing area. Among the participants there were many leading experts, as well as graduate students, postdocs, and other junior researchers.

The research and survey articles, written for the volume, address cutting edge issues of the newly developing imaging modalities (photoacoustics, current impedance imaging, hybrid imaging techniques, elasticity imaging), as well as the recent progress in resolving outstanding problems of more traditional modalities, such as SPECT, ultrasound imaging, and inverse transport theory. Related topics of invisibility cloaking are also considered.

The editors
July 15, 2011

List of Workshop Participants

- M. Allmaras (Texas A&M University)
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- S. Arridge (University College London)
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- H. Liu (University of Washington)
- M. Machida (University of Pennsylvania)
- A. Malcolm (Massachusetts Institute of Technology)
- A. Manduca (Mayo Clinic)
- V. Markel (University of Pennsylvania)

- J. McLaughlin (Rensselaer Polytechnic Institute)
- S. Moskow (Drexel University)
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- F. Natterer (University of Münster, Germany)
- L. V. Nguyen (University of Idaho)
- V. Palamodov (Tel Aviv University, Israel)
- S. Patch (University of Wisconsin, Milwaukee)
- E. T. Quinto (Tufts University)
- K. Ren (University of Texas at Austin)
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This volume contains research and review articles written by participants of two related international workshops “Mathematical Methods in Emerging Modalities of Medical Imaging” (October 2009) and “Inverse Transport Theory and Tomography” (May 2010), which were held at the Banff International Research Station in Banff, Canada. These workshops brought together mathematicians, physicists, engineers, and medical researchers working at the cutting edge of medical imaging research and addressed the demanding mathematical problems arising in this area.

The articles, written by leading experts, address important analytic, numerical, and physical issues of the newly developing imaging modalities (e.g., photoacoustics, current impedance imaging, hybrid imaging techniques, elasticity imaging), as well as the recent progress in resolving outstanding problems of more traditional modalities, such as SPECT, ultrasound imaging, and inverse transport theory. Related topics of invisibility cloaking are also addressed.

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