

2014 Workshop in Harmonic Analysis and its Applications

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Macquarie University, Sydney

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The purpose of the workshop was to bring together leading international and Australian researchers as well as early-career researchers and PhD students, in Harmonic Analysis and related areas, for the dissemination of the most recent developments in the field, and for discussions on future directions.

It was organised by Xuan Duong (Macquarie), Chris Meaney (Macquarie) and Lesley Ward (University of South Australia). It was sponsored by the Australian Mathematical Sciences Institute, the Australian Mathematical Society, the Centre for Industrial and Applied Mathematics (CIAM), School of Information Technology and Mathematical Sciences, University of South Australia, and the Department of Mathematics, Macquarie University.

We had 52 participants from 7 countries, including 13 female and 15 from overseas. There were 31 academics (20 are based at Australian institutions and 11 at overseas institutions), 19 students (15 at Australian institutions and 4 at overseas institutions), 1 participant employed by an Australian company, and 1 unemployed. There were 13 AustMS members

There were 26 talks, comprising twenty 45-minute talks, and six 25-minute short talks for ECRs, postdocs and PhD students. They addressed many topics in harmonic analysis and related areas.

The four principal speakers were

- Leonardo Colzani, Universita di Milano-Bicocca, Italy,
- Michael Lacey, Georgia Institute of Technology, USA
- Carlos Perez, Universidad de Sevilla, Spain
- Jill Pipher, Institute for Computational and Experimental Research in Mathematics (ICERM) and Brown University, USA.

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5-digit codes in descending order of relevance: 4 2-B-37, 42-B-20, 35-J-45

Fields of Research (FOR) code: 6-digit codes in descending order of relevance: 01-01-06, 01-01-10, 01-01-08

Topics covered in the talks included:

- Harmonic Analysis: Estimates on singular integrals, holomorphic functional calculi, Carleson measures, harmonic analysis on product spaces.
- Partial differential equations: Elliptic and parabolic systems, homogenization of elliptic equations, heat kernel estimates, eigenfunctions expansion, Strichartz estimates on manifolds.
- Applied harmonic analysis: Image visualization, prolate shifts and sampling.



The talks gave quite a few recent important results at the frontier of the research topics. All the talks were well attended. In the organisers' opinion the workshop was highly successful as reflected by comments from the participants in a survey carried out near the end of the workshop. This survey attracted 16 responses, which were overwhelmingly positive.

One of the highlights of the workshop was the lecture on The Two Weight Inequality for the Cauchy Transform given by Michael Lacey which verifies a conjecture of Nazarov–Treil–Volberg.

Social events: In addition to the conference dinner, we organised two further social events. We held a women's lunch on the second day, attended by about 10 women mathematicians. Participants included senior and mid-career mathematicians, as well as ECRs and PhD students, from several countries. The third afternoon had no scheduled talks; some participants took the opportunity for research discussions while others joined our excursion by train and ferry for a walk around Bradley's Head, near Taronga Zoo.