



SMRI News

The Sydney Mathematical Research Institute

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I am writing this report at an especially exciting time for the Sydney Mathematical Research Institute (<https://sydney.edu.au/research/centres/mathematical-research-institute.html>) which is about to acquire its first dedicated location on the campus of the University of Sydney, separate from the Carslaw Building which houses the School of Mathematics and Statistics. The new SMRI offices will be a short walk away in the Main Quadrangle, the historic heart of the university and reputedly one of the ten most photographed sites in Sydney.

We look forward to giving our visiting researchers such a beautiful environment for their work, in a space which will encourage interaction with each other and with members of the School, without being overcrowded. For most of the remainder of 2019, we expect to have around 8–10 international visitors at any time, with the average length of stay at SMRI being about one month. By design, many of these researchers will also visit other universities while they are in Australia.

The previous SMRI News listed the successful applicants in the 2018 round of our International Visitor Program, and the successful applicants in the first of the two 2019 rounds are listed below. The SMRI Scientific Advisory Committee was again delighted to be able to help bring so many distinguished researchers to Australia. Let me highlight a few to illustrate the range of types of visits we are keen to fund. Andrea Bertozzi from UCLA will visit for one month, splitting her time between the University of Adelaide and the University of Sydney. Tom Bridgeland from Sheffield will spend a whole semester at the University of Sydney. Darren Crowdy from Imperial College will visit four different universities in the course of his six-week Australian tour. This scheme is not restricted to field-leading senior researchers like those previously mentioned: Waltraud Lederle, an early-career researcher from UC Louvain in Belgium, will visit for two months, spending the majority of her time at the University of Newcastle.

Applications are now open for the second 2019 round, closing on Sunday 28 July (Sydney time), which is for visits taking place within the period April–December 2020. The terms and conditions and application form are on the SMRI webpage, and I again encourage all AustMS members to take advantage of this means of funding Australian visits by international researchers in the mathematical sciences. One change to the terms is worth noting: as a result of consistent feedback from potential applicants, we have reverted to the system where academic references are called for after the deadline if required, not submitted before the deadline.

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We particularly welcome applications from female and gender-diverse researchers, as well as researchers belonging to other groups which are underrepresented in the mathematical sciences. It is a concern that only 12% of the international applicants in the first two IVP rounds were female, which resulted in only 16% of the successful applicants being female. Interestingly, the gender balance among applicants' Australian hosts was much closer to being representative of the discipline. The SMRI executive is currently investigating ways to achieve a better gender balance among our visiting researchers.

International Visitor Program — January 2019 round

Successful Applicants²

Sydney Mathematical Research Institute acknowledges the valuable contributions (financial and otherwise) to the International Visitor Program made by the School of Mathematics and Statistics at the University of Sydney and by the hosts and universities listed below.

Jan Obloj (University of Oxford)

Research interests: Probability theory and financial mathematics

Dates: 5 August – 31 October 2019 (University of Sydney, *Host:* Anna Aksamit)

1–15 November 2019 (Monash University, *Host:* Gregoire Loeper)

16 November – 20 December 2019 (University of Technology Sydney, *Host:* Eckhard Platen)

Daryl Cooper (University of California, Santa Barbara)

Research interests: Topology, geometric group theory, 3-manifolds, surface subgroups, hyperbolic geometry, projective structures, non-standard analysis

Dates: 1 September – 15 December 2019 (University of Sydney, *Host:* Stephan Tillmann)

William Casselman (University of British Columbia)

Research interests: Automorphic forms, representation theory, algorithms for Lie algebras and Coxeter groups

Dates: 1–31 October 2019 (University of Sydney, *Host:* Geordie Williamson)

Andrea Bertozzi (University of California, Los Angeles)

Research interests: Nonlinear PDE, fluid dynamics, social science models, swarming, image processing and data science

Dates: 1–15 November 2019 (University of Adelaide, *Host:* Yvonne Stokes)

15–30 November 2019 (University of Sydney, *Host:* Nalini Joshi)

²Dates are as of 1 April 2019 and are subject to change. For updated information see the SMRI webpage.

Ilya Shkredov (Steklov Mathematical Institute)

Research interests: Additive combinatorics, number theory, combinatorial and ergodic number theory

Dates: 1 November – 1 December 2019 (University of Sydney, *Host:* Alexander Fish)

Ivan Graham (University of Bath)

Research interests: Numerical analysis, partial differential equations, uncertainty quantification

Dates: 15 November 2019 – 31 January 2020 (University of New South Wales, *Host:* Frances Kuo)

1–15 February 2020 (University of Sydney, *Host:* Georg Gottwald)

Frédéric Campana (University of Lorraine)

Research interests: Complex geometry, bimeromorphic classification of compact Kahler and complex projective manifolds, arithmetic geometry and complex hyperbolicity, fundamental groups, twistor spaces, algebraicity of foliations, moduli

Dates: 16 November – 15 December 2019 (University of Sydney, *Host:* Behrouz Taji)

Paolo Rossi (Università degli Studi di Padova)

Research interests: Moduli spaces of curves, classical and quantum integrable systems, Frobenius manifolds and mirror symmetry, geometric invariants from enumerative geometry, symplectic topological invariants

Dates: 7 January – 2 February 2020 (University of Sydney, *Host:* Nalini Joshi)

2–14 February 2020 (Flinders University, *Host:* Yang Shi)

Maksym Fedorchuk (Boston College)

Research interests: Moduli spaces of curves, stability of projective varieties, geometric invariant theory

Dates (tentative): 7–31 January 2020 (University of Sydney, *Host:* Behrouz Taji)

1–29 February 2020 (Australian National University, *Host:* Anand Deopurkar)

Tom Bridgeland (University of Sheffield)

Research interests: Algebraic geometry, homological algebra, mirror symmetry

Dates: 15 January – 31 May 2020 (University of Sydney, *Host:* Geordie Williamson)

Laurentiu Maxim (University of Wisconsin, Madison)

Research interests: Perverse sheaves and applications to singularities, topology of hypersurfaces singularities, characteristic classes of singular spaces, Hodge theory and birational geometry

Dates: 15 January – 15 March 2020 (University of Sydney, *Host:* Laurentiu Paunescu)

Joel Kamnitzer (University of Toronto)

Research interests: Geometric and combinatorial representation theory

Dates: 1 February 2020–TBA (University of Sydney, *Host:* Oded Yacobi)

Peter Duck (University of Manchester)

Research interests: Theoretical and computational fluid dynamics, financial mathematics

Dates (tentative): 1–14 February 2020 (Macquarie University, *Host:* Sophie Calabretto)

15–29 February 2020 (University of Technology Sydney, *Host:* Kristoffer Glover)

1–15 March 2020 (University of Sydney, *Host:* Sharon Stephen)

Zuhaila Ismail (Universiti Teknologi Malaysia)

Research interests: Non-Newtonian fluid mechanics, physiological flows, boundary layer flow and convective heat transfer

Dates: 2–16 February 2020 (University of Sydney, *Host:* Mary Myerscough)

17 February – 14 June 2020 (Griffith University, *Host:* Peter Johnston)

Waltraud Lederle (UC Louvain)

Research interests: Geometric group theory, totally disconnected locally compact groups, groups (almost) acting on trees, rigidity theory

Dates: 10 February – 24 March 2020 (University of Newcastle, *Host:* George Willis)

25 March – 10 April 2020 (University of Sydney, *Hosts:* Anne Thomas and Jacqui Ramagge)

Dave Smith (Yale-NUS College)

Research interests: Spectral theory of differential operators, well-posedness of initial boundary value problems for linear PDE, complex boundary conditions

Dates: 25 February – 5 June 2020 (University of Sydney, *Host:* Robert Marangell)

Monique Jeanblanc (University of Evry)

Research interests: Enlargement of filtrations, portfolio optimization, default risk

Dates: 1–29 March, 6–12 April, 27 April – 1 May 2020 (University of Sydney, *Hosts:* Marek Rutkowski and Anna Aksamit)

30 March – 5 April 2020 (Monash University, *Hosts:* Fima Klebaner and Gregoire Loeper)

13–26 April 2020 (University of New South Wales, *Host:* Libo Li)

Darren Crowdy (Imperial College, London)

Research interests: Applied and computational complex analysis, special function theory, fluid and solid mechanics

Dates: 23–29 March 2020 (University of Adelaide, *Host:* Yvonne Stokes)

30 March – 5 April 2020 (University of South Australia, *Host:* Lesley Ward)

6–19 April 2020 (University of Sydney, *Host:* Nalini Joshi)

20 April – 4 May 2020 (Macquarie University, *Host:* Christopher Green)

Gregory Berkolaiko (Texas A&M University)

Research interests: Spectral theory of differential operators and graphs and networks

Dates (tentative): 1 May – 5 June 2020 (University of Sydney, *Host:* Robert Marangell)



Anthony Henderson is currently the Executive Director of the University of Sydney Mathematical Research Institute, which he helped to establish in 2018. After obtaining his PhD from the Massachusetts Institute of Technology in 2001, he returned to the University of Sydney as a postdoctoral researcher and has worked there ever since. For his publications in geometric and combinatorial aspects of representation theory, Anthony was awarded the Christopher Heyde Medal in 2011 and the Australian Mathematical Society Medal in 2012. He also received a Faculty of Science Citation for Excellence in Teaching in 2009, and his Honours-level lecture notes on Lie algebras were published by Cambridge University Press in 2012. He is a founding Director of the Simon Marais Mathematics Competition for undergraduates in the Asia-Pacific region.