The Sydney Mathematical Research Institute

Anthony Henderson*

On 12 November 2018, the University of Sydney officially launched a new "flagship initiative", the Sydney Mathematical Research Institute (SMRI), with Professor Geordie Williamson as Director and myself (Anthony Henderson) as Executive Director. Our webpage is https://sydney.edu.au/research/centres/mathematical-research-institute.html.

This launch followed one of the most successful and rapid funding drives in Australian mathematical history, led by Professor Jacqui Ramagge (the Head of our School of Mathematics and Statistics, as well as being the current President of AustMS), which secured $6.5 million in donations in less than a year to establish SMRI.

The need for research institutes in Australia comparable to the well-known institutes overseas (MSRI, Isaac Newton Institute, PIMS, Oberwolfach, etc.) has long been felt, and was highlighted in the Australian Academy of Science's Decadal Plan *The mathematical sciences in Australia: A vision for 2025*. Over recent years a national framework has begun to take a clearer shape, with various organisations offering different aspects of those overseas institutes' functions: for example, the themed special years run by the Mathematical Sciences Institute at ANU, the graduate-level summer and winter schools run by AMSI, the intensive research programs and workshops run by MATRIX.

What will SMRI add to this framework? The simplest way to answer that is to point to our main overseas template, the Max Planck Institute for Mathematics in Bonn. Like MPIM, we aim to be a hub for visiting researchers from other countries, and to run events and public outreach programs connected to research in the mathematical sciences. Wherever possible we will act in concert with other institutes, avoiding unnecessary duplication and competition, to help bring about the greatest benefit for the discipline nationally. To this end we are grateful to the Directors of AMSI and MATRIX who have joined eminent international researchers on our Advisory Board (for the membership, see our webpage).

Later reports will introduce more of SMRI's features and activities, but here I want to focus on what we see as our core function, our International Visitor Program. This aims to support visits to Australia (and not just to Sydney) by researchers in the mathematical sciences working in other countries, and we hope that many AustMS members will benefit from the opportunity to collaborate face-to-face with international researchers in their area. We also welcome feedback on how the program could be improved.

*Sydney Mathematical Research Institute, University of Sydney.
Email: anthony.henderson@sydney.edu.au

According to the current terms and conditions (of which full details are on our webpage), applicants to this program should have a PhD and a track record of research in the mathematical sciences, and should propose a research visit to Australian universities (and/or institutes such as MATRIX) of at least 1 month in total, including at least 2 weeks at SMRI. We can provide international airfare and visa fee reimbursement as well as a generous level of living allowance.

To decide on the applications we have formed a Scientific Advisory Committee with national and international representation, breadth across areas and gender diversity (for the membership, see our webpage). The selection criteria are: the applicant's research track record relative to opportunity; the benefits of the proposed visit for Australian research; and considerations of diversity, equity and inclusion.

The successful applicants from our first application round are listed below. Our second application round closed in January 2019, and I look forward to announcing the successful applicants in the next issue of the Gazette. Applications are now open for the third round, closing in July 2019, which is for visits taking place within the period April–December 2020. The application form is linked from our webpage. I urge all AustMS members to spread the word about this program among their international contacts and collaborators, and help make Australia a regular stop on the global mathematical itinerary.

International Visitor Program — August 2018 round

Successful Applicants[1]

> *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.*

Matthias Lesch (University of Bonn)

Research interests: Elliptic operators, heat equation methods, spectral zeta functions, spectral flow, unbounded Kasparov modules

Dates: 1–14 May 2019 (University of Sydney, *Host:* Jacqui Ramagge)
15 May – 31 July 2019 (University of Wollongong, *Hosts:* Adam Rennie and Alan Carey)

Frank Nijhoff (University of Leeds)

Research interests: Discrete systems, variational calculus, quantum mechanics, partial differential equations, difference equations

Dates: 23 May – 16 June 2019 (La Trobe University, *Host:* Reinout Quispel)
17 June – 15 July 2019 (University of Sydney, *Host:* Nalini Joshi)

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[1]Dates are as of 30 January 2019 and are subject to change. For updated information see the SMRI webpage.

Vladimir Dragović (University of Texas, Dallas)

Research interests: Integrable dynamical systems, algebraic curves, quantum Yang-Baxter equation, Painlevé equations, billiards

Dates: 26 May – 9 June 2019 (University of Sydney, *Host*: Milena Radnović)
10–19 June 2019 (University of New South Wales, *Host*: Vera Roshchina)
20–26 June 2019 (University of Sydney, *continued*)

Franz Pedit (University of Massachusetts, Amherst)

Research interests: Differential geometry, integrable systems, harmonic maps

Dates: 3 June – 2 August 2019 (University of Sydney, *Host:* Emma Carberry)

Alexandru Hening (Tufts University)

Research interests: Stochastic processes, mathematical ecology, mathematical biology, mathematical finance, Markov processes, asymptotic properties of stochastic processes

Dates: 15 June – 1 August 2019 (University of Sydney, *Host*: Ben Goldys)
2–15 August 2019 (University of Queensland, *Host:* Ross McVinish)
16 August – 1 October 2019 (Monash University, *Host:* Fima Klebaner)

Sergey Dolgov (University of Bath)

Research interests: Numerical linear algebra, high-dimensional approximations, uncertainty quantification

Dates: 17–30 June 2019 (University of Sydney)
1–28 July 2019 (Monash University, *Host*: Tiangang Cui)

Henning Krause (Bielefeld University)

Research interests: Representation theory, homological algebra, derived categories

Dates: 26 June – 14 July 2019 (University of Sydney, *Hosts:* Kevin Coulembier and Oded Yacobi)
15–18 July 2019 (The Australian National University, *Host:* Amnon Neeman)
19–25 July 2019 (University of Sydney, *continued*)

Syarifah Nordin (Universiti Teknologi Malaysia)

Research interests: Task scheduling, parallel processor system, mixed integer linear programming, optimization

Dates: 1–13 July 2019 (University of Sydney)
14 July – 20 December 2019 (Curtin University,*Host:* Louis Caccetta)

Adam Parusiński (University of Nice)

Research interests: Singularities, stratifications, real algebraic geometry

Dates: 1 July – 31 August 2019 (University of Sydney, *Host*: Laurentiu Paunescu)

Alexey Slunyaev (Institute of Applied Physics, Russian Academy of Sciences)

Research interests: Nonlinear waves, evolution equations, water waves, solitons, rogue waves

Dates: 1–14 July 2019 (University of Sydney, *Host:* Amin Chabchoub)
15 July – 31 August 2019 (University of Southern Queensland, *Host:* Yury Stepanyants)

Joseph Maher (CUNY College, Staten Island)

Research interests: Geometric topology, random walks

Dates: 8–14 July 2019 (University of Melbourne, *Host:* Hyam Rubinstein)
22–28 July 2019 (Monash University, *Host:* Jessica Purcell)
29 July – 25 August 2019 (University of Sydney, *Host:* Stephan Tillmann)

Diego Pazó (University of Cantabria)

Research interests: Synchronization phenomena, coupled oscillators, space-time chaos

Dates: 13 July – 31 August 2019 (University of Sydney, *Host:* Georg Gottwald)

Barbara Brandolini (University of Naples)

Research interests: Weak solutions, anisotropic equations, Poincaré-Wirtinger inequality, Wiener spaces

Dates: 15 July – 20 September 2019 (University of Sydney, *Host:* Florica Cîrstea)

Antoine Ayache (University of Lille)

Research interests: Stochastic fields of a fractal nature, sample path behaviour, statistical inference, wavelets, random series, local times

Dates: 17–31 July 2019 (University of Sydney)
1–30 August 2019 (La Trobe University, *Host:* Andriy Olenko)

Claude Viallet (Sorbonne University)

Research interests: Discrete integrable systems, algebraic structures in mathematical physics

Dates: 21 July – 11 August 2019 (University of Sydney, *Host:* Nalini Joshi)
12–17 August 2019 (Flinders University, *Host:* Yang Shi)
18–24 August 2019 (University of Sydney, *continued*)

Eric Ragoucy (Laboratoire d'Annecy-le-Vieux)

Research interests: Bethe ansatz, W-algebras, out-of-equilibrium statistical physics

Dates: 26 August – 6 September 2019 (University of Sydney, *Host:* Alexander Molev)
9–27 September 2019 (University of Queensland, *Host:* Jorgen Rasmussen)
30 September – 18 October 2019 (University of Melbourne, *Host:* Michael Wheeler)
21 October – 1 November 2019 (University of Tasmania, *Host: Peter Jarvis)*
4–8 November 2019 (University of Sydney, *continued*)

Dror Bar-Natan (University of Toronto)

Research interests: Quantum algebra, knot theory

Dates: 1 September – 31 October 2019 (University of Sydney, *Host:* Zsuzsanna Dancso)

Jitesh Gajjar (University of Manchester)

Research interests: Fluid dynamics, asymptotics

Dates: 22 September – 13 October 2019 (University of Sydney, *Host:* Sharon Stephen)
14–27 October 2019 (Monash University, *Host:* Philip Hall)
28 October – 3 November 2019 (University of Sydney, *continued*)

Ian Melbourne (University of Warwick)

Research interests: Lévy processes, deterministic dynamical systems, anomalous diffusion

Dates: 18 February – 18 April 2020 (University of Sydney, *Host:* Georg Gottwald)

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.