AustMS Early-Career Workshop

6th December 2021

Organisers:
Sophie Calabretto
Mat Langford
Valentina Wheeler

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Morally sponsored by:

Contents

1   Welcome

Welcome to the AustMS Early-Career Workshop 2021! We hope you will find the mix of talks inspiring and informative, and that you will enjoy interacting (digitally) with your fellow ECRs.

We thank our moral sponsors, AMSI and AustMS, and David Allingham from the University of Newcastle for his help with the logistics of this online event.

Sophie Calabretto
Mat Langford (local liaison)
Valentina Wheeler

In the spirit of reconciliation the AustMS ECW 2021 acknowledges the Traditional Custodians of country throughout Australia and their connections to land, sea, and community. We pay our respect to their elders past, present, and emerging, and extend that respect to all Aboriginal and Torres Strait Islander peoples today. They have never ceded sovereignty, and remain strong in their enduring connection to land and culture.

We support the Uluru Statement from the Heart to achieve justice, recognition and respect for First Nations people and a referendum to enshrine a First Nations Voice in the Constitution. We accept the invitation contained in the Statement to walk together with Aboriginal and Torres Strait Islander peoples in a movement of the Australian people for a better future.

2 Workshop Details

The AustMS ECW 2021 will be held online via Zoom. Zoom is available for PC, Mac, iPad, iPhone, or Android.

To download **Zoom Client for Meetings**, or the **Zoom Add-in for Microsoft Outlook**, please visit the Zoom Download Center. Alternatively, the workshop can also be accessed via Zoom online.

Registered attendees will receive a Zoom link and password closer to the date of the workshop.

Unfortunately, neither Closed Captioning nor Auslan interpreting services are able to be provided for this online event.

3 Programme

Monday 6th December	
09:15-9:30	Welcome
9:30–10:00	Nina Holden
10:00–10:30	Ivan Guo
10:30–11:00	Maria Athanassenas
11:00–11:30	Q&A with morning workshop speakers
11:30–13:30	(BYO) Lunch break*
13:30–14:00	Brian Alspach
14:00–14:30	Geordie Williamson
14:30–15:00	Jennifer Flegg
15:00–15:30	Q&A with afternoon workshop speakers
15:30–15:45	Closing

* Refreshments not provided in online format.

4   Speakers
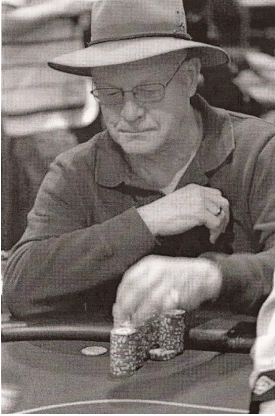
Brian Alspach

University of Newcastle

Brian has obtained his PhD from University of California at Santa Barbara in 1966 under supervision of Paul J Kelly. Between 1966 and 1999 he has held a position at Simon Fraser University followed by an Adjunct Professorship at University of Regina from 2000 to 2007. Since 2007 he holds an Honorary Professorship at University of Newcastle.

Brian has an impressive record of more than 120 research publications in graph theory from 1967 to present and more than 150 articles in poker magazines about poker and mathematics and he is the Winner of 2014 Euler Medal.

Being highly interested in the interaction between mathematics and business, industry and Government, Brian has taken part in (and organized one) many industrial problem solving workshops and started and was in charge of a unique degree program at Simon Fraser University which is a combination of business, computing and mathematics.

Stepping Into The "Real" World: For many years I have advocated for mathematicians to try to involve themselves in business, industry and/or government problems. I shall discuss industrial problem solving workshops and some issues that arise in consulting work.
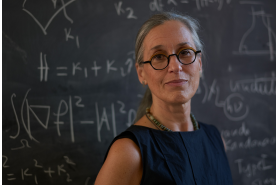
Maria Athanassenas

Department of Defence

Maria Athanassenas graduated from the University of Bonn, Germany, with a PhD in Mathematics with second major Physics. After a 20 years career in academia (including University of Augsburg, University of Melbourne, Monash University) and curious about new challenges she joined the Defence Science and Technology Group (DSTG) in 2010. Maria led the 'Space Task' in the Joint and Operations Analysis Division (JOAD), Aerospace Capability Analysis branch until 2015, working as a systems analyst and leading a multidisciplinary team addressing problems in the Space domain. From 2015 to 2020, Maria led the Maritime Mathematical Sciences (MMS) group in JOAD, Maritime Capability Analysis. MMS applies mathematical modelling, operations research and simulation techniques to problems in the Maritime domain. Currently, she is the Scientific Adviser Maritime - a liaison position interfacing between Navy and DSTG. Her academic research interests lie in the areas of geometric analysis and the study of capillarity phenomena; complex networks and the study of resilience and robustness of complex systems. Maria's two children managed to survive her idiosyncratic, mathematical, single-mother parenting skills to adulthood. Maria speaks and loves reading in 4+ languages, and plays (or, thinks she can play) some classical guitar and the piano.

Curiosity, new interests and growing through challenges: I will talk a bit about the skills that served me well in an evolving career, will touch on what skills I am looking for as recruitment panel member, and will try to avoid giving advice (that would be understanding what makes someone tick and growing through challenges).

Jennifer Flegg

University of Melbourne

Jennifer is an Associate Professor in applied mathematics in the School of Mathematics and Statistics at the University of Melbourne. Her research focuses on using mathematics and statistics to answer questions in biology and medicine. In particular, she has developed mathematical models in areas such as wound healing, tumour growth and infectious disease epidemiology. She was awarded a PhD in 2009 from Queensland University of Technology on "Mathematical modelling of chronic wound healing". From 2010-2013, Jennifer was based at the University of Oxford developing mathematical models for the spread of resistance to antimalarial drugs before joining the School of Mathematical Sciences at Monash University (2014-2017) as a lecturer. In May 2017 Jennifer joined the School of Mathematics and Statistics at the University of Melbourne as a Senior Lecturer in Applied Mathematics and was promoted to Associate Professor in 2020.

Learning to accept rejection: In this talk, I will discuss my top tips for learning to cope with the frequent rejection that seems to come with being in academia. I'll talk about my own personal experiences of failure in academia and discuss how for most academics who you might think of as "successful", there is often a lot of rejection behind the scenes.

Ivan Guo

Monash University

Ivan completed his PhD in mathematics at the University of Sydney in 2014. Since then he has undertaken academic positions at the University of Wollongong and Monash University. Currently Ivan is a senior lecturer at Monash University, and is the deputy director of the Monash Centre for Quantitative Finance and Investment Strategies, as well as the course director for the Monash Master of Financial Mathematics program. Ivan is a member of the Australian Mathematical Olympiad Committee, serving as the chair of the Senior Problems Committee. His research interests include financial mathematics, stochastic control, optimal transport and stochastic game theory.

Dualities in Financial Mathematics: In this talk, I will briefly describe my research field of financial mathematics, which sits at the intersection of probability, analysis and computational mathematics. In particular, my current research interests revolve around the application of optimal transport in financial mathematics, where topological dualities have interesting practical interpretations in robust finance, model calibration and portfolio selection. I will also talk about my personal experiences as an ECR.

Nina Holden

ETH Zurich

Nina Holden has bachelor and master degrees from the University of Oslo and a PhD in mathematics from the Massachusetts Institute of Technology. She obtained her PhD in 2018 under the supervision of Scott Sheffield. Since then she has been a postdoc at ETH Zurich, and from next fall she will be an Associate Professor at the Courant Institute of Mathematical Sciences. She also has experience from jobs outside of academia.

Probability theory in industry and academia: I will present my experience with working on probability theory in the industry and academia, focusing on my time in a power company and my research on random geometry.

Geordie Williamson

University of Sydney

Geordie Williamson FRS FAA is Professor of Mathematics and Director of the Mathematical Research Institute at the University of Sydney. Geordie grew up in the Southern Highlands of New South Wales, Australia. He was an undergraduate at the University of Sydney, and completed his PhD at the University of Freiburg in Germany. Following his PhD studies he was a Junior Research Fellow at Oxford for three years, and then an Advanced Researcher at the Max Planck Institute for Mathematics in Bonn. Last academic year directed a year-long research program at the Institute for Advanced Study (IAS) in Princeton. Geordie has lectured all over the world, and has had visiting positions in the US, Germany and Japan. His has been awarded several prizes for his work, including the Chevalley Prize of the American Mathematical Society (2016), the European Mathematical Society Prize (2016), the Clay Research Award (2016), the New Horizons in Mathematics Prize (2017), the Medal of the Australian Mathematical Society (2018) and the Christopher Heyde Medal of the Australian Academy of Sciences (2018). In 2018 he was elected to the Australian Academy of Sciences and the Royal Society.

How did I become a mathematician?: There is a famous "CV of failures" that has been doing the rounds of the internet for several years now. It documents all the grants, jobs and professional acknowledgements that someone *didn't* get. As the author notes, their "CV of failures" led to a meta-failure: it became their most-cited work. I want to talk a little about how I became a mathematician. The emphasis will be on chance encounters, setbacks and all the stuff that doesn't usually make it onto a CV.