



## Welcome – Wednesday 6 February 2019

TIME	ACTIVITY	VENUE
2:00 PM	<i>Bus Transport from Airport to International House Group 1 (Sydney, Wollongong, Canberra, Brisbane, Armadale, Adelaide arrivals)</i>	
3:00 PM	Movie screening	Tute Room 2
4:30 PM	<i>Bus Transport from Airport to International House Group 2 (Perth and Newcastle arrivals)</i>	
5:00-5:30 PM	Student Registration	International House
5:30-6:30 PM	Team Building / Icebreaker Activity - AMSIConnect Dodgeball Tournament	Basketball Courts
6:30-8:00 PM	<b>PIZZA DINNER</b>	<b>Basketball Courts</b>

## Conference Day 1 – Thursday 7 February 2019

TIME	ACTIVITY	VENUE
<i>Session chair</i>	<i>Chloe Pearse Australian Mathematical Sciences Institute (AMSI)</i>	Tute Room 2
9:00-9:15 AM	<b>WELCOME</b>	<b>Tute Room 2</b>
9:15-9:45 AM	Guest Speaker: Life as a PhD Student <b>Laura Karantgis, La Trobe University</b>	Tute Room 2
9:45-10:15 AM	Guest Speaker: Life as a Researcher <b>Professor Steven Siems, Monash University</b>	Tute Room 2
10:15-10:30 AM	Group Photo	Courtyard
10:30-11:00 AM	<b>MORNING TEA</b>	<b>Foyer</b>
	<b>Tute Room 1</b>	<b>Tute Room 2</b>
<i>Session chairs</i>	<i>Dr Laurence Field Australian National University</i>	<i>Professor Barry Hughes The University of Melbourne</i>
	<i>Dr Natalie Karavarsamis La Trobe University</i>	
11:00-11:20 AM	Proof of calculi equivalence in the HOL theorem prover <b>Alexander Cox Australian National University</b>	Multi-species exclusion processes with motion persistence <b>Stephen Zhang The University of Melbourne</b>
		An R package for occupancy model parameter estimation using the two-stage approach <b>Phillip Newbold La Trobe University</b>
11:20-11:40 AM	Rate of Convergence for the Central Limit Theorem <b>Hugh Entwistle Macquarie University</b>	Random walks on derived graphs <b>Alastair Anderberg The University of Newcastle</b>
		Is anybody home? Modelling frog occupancy at the La Trobe Wildlife Sanctuary <b>Kevin Newman La Trobe University</b>
11:40-12:00 PM	Quaternions and Octonions <b>James McCusker The University of Adelaide</b>	Trisecting hyperbolic 4-manifolds <b>Michael Zhao The University of Sydney</b>
		Modelling with Differential Equations <b>Chloe Wilkins The University of Newcastle</b>



12:00-12:20 PM	Harmonic Functions and Brownian Motion <b>Douglas Coulter</b> Australian National University	Closed Geodesics on Euclidean Homogeneous Spaces <b>Rohin Berichon</b> The University of Queensland	Fusion categories from representations of quantum $sl(2)$ at roots of unity <b>Gavriilo Sipka</b> The University of Queensland
12:20-1:20 PM	<b>LUNCH</b>		<b>Foyer</b>
	<i>Tute Room 1</i>	<i>Tute Room 2</i>	<i>Tute Room 3</i>
<i>Session chairs</i>	<i>Dr Georgy Sofronov</i> Macquarie University	<i>A/Prof. Peter Pudney</i> University of South Australia	<i>Dr Peter Kim</i> The University of Sydney
1:20-1:40 PM	Analysis of Chances of Winning in a Poker game: Combinatorial Probability and the Law of Large Numbers <b>Andy Tang</b> Macquarie University	Optimal partitioning of photovoltaic cells on a curved solar collector <b>Maria Kapsis</b> University of South Australia	Mathematical Modelling of Mating Strategies Among Primates <b>Nicholas Fazio</b> The University of Sydney
1:40-2:00 PM	The Geometric and Probabilistic Structure of Classical Physical Theories <b>Shay Tobin</b> Macquarie University	Optimal cruise control with dual electric motors <b>Thomas Miller</b> University of South Australia	A Giggle a Minute: Agent-based Modelling of Laughter Propagation in an Audience <b>Theresa O'Brien</b> University of Wollongong
2:00-2:20 PM	Cocyclic Hadamard Matrices <b>Kshitija Vaidya</b> Monash University	A Markov-Chain-Based Investigation into Renewable Energy Storage in South Australia <b>Scott Carnie-Bronca</b> The University of Adelaide	Diagnostic tools for linear mixed models <b>John Su</b> The University of Sydney
2:20-2:40 PM	Simple groups of infinite matrices <b>Peter Groenhout</b> The University of Newcastle	Modelling Wind Farm Power Output Using Hidden Markov Models and its Implications for South Australian Wind Farms <b>William Abbott</b> The University of Adelaide	Baking cake: a mathematical model <b>Vivien Yeung</b> University of Wollongong
2:40-3:00 PM	<b>AFTERNOON TEA</b>		<b>Foyer</b>
	<i>Tute Room 1</i>	<i>Tute Room 2</i>	<i>Tute Room 3</i>
<i>Session chairs</i>	<i>A/Prof. Stephen Davis</i> RMIT University	<i>Dr Leo Brewin</i> Monash University	<i>Boris Lishak</i> The University of Sydney
3:00-3:20 PM	Mathematical modelling of the long-term dynamics of Cyprinid herpes virus 3 <b>Genevieve Batten</b> RMIT University	Precession of the Perihelia in a Schwarzschild Spacetime <b>Kyria Wawryk</b> Monash University	Evaluating an Augmented Reality Experience to Determine Play Strategies <b>Rudra Kumar</b> Deakin University
3:20-3:40 PM	Estimating population attributable fractions in the presence of competing risks <b>Ian Powell</b> The University of New South Wales	Directed Walk Model for Polymer Propagation <b>Jonathon Liu</b> The University of Melbourne	Experiments with Trust Regions and the BFGS method in nonsmooth optimisation <b>Daniel Molent</b> RMIT University



3:40-4:00 PM	Modelling of infectious diseases <b>Timothy Lapuz</b> The University of Sydney	Polymer Models and Directed Walks <b>Leo Li</b> The University of Melbourne	How To Measure a Halo <b>Kanupriya Agarwal</b> Queensland University of Technology
4:00-4:20 PM	Developing a Within-Host Model for Plasmodium vivax in an Endemic Setting <b>Somya Mehra</b> The University of Melbourne	Calculating thermal diffusivity from laser flash experiments <b>Christyn Wood</b> Queensland University of Technology	The Mathematics of Neuron flows in the Brain <b>Tom Goodwin</b> University of Technology Sydney
4:20-4:40 PM	Modelling the effect of Multidrug therapy on the dynamics of influenza A infection in a human host <b>Amir Farid Kaveh</b> The University of Melbourne	The Shape of a Drum <b>Rumi Salazar</b> The University of New South Wales	Applications of Artificial Neural Networks to Structured Data <b>Daniel Condon</b> University of Technology Sydney
4:40-5:00 PM	<b>DAY 1 WRAP UP</b>		<b>Tute Room 2</b>
5:00-6:00 PM	Free Time		
6:00-7:30 PM	<b>BBQ DINNER</b>		<b>Courtyard</b>

### Conference Day 2 - Friday 8 February 2019

TIME	ACTIVITY			VENUE
9:00-9:15 AM	<b>WELCOME</b>			<b>Tute Room 2</b>
	<i>Tute Room 1</i>	<i>Tute Room 2</i>	<i>Tute Room 3</i>	
<b>Session chairs</b>	<i>Dr Belinda Spratt</i> Queensland University of Technology	<i>Dr Toen Castle</i> La Trobe University	<i>Dr Daniel Hauer</i> The University of Sydney	
09:20-9:40 AM	Outpatient Scheduling in Public Hospitals <b>Jamie Owen</b> Queensland University of Technology	Chemical Geometry and Topology <b>Jade Bujeya</b> La Trobe University	Powers of Maximal Monotone Operators <b>William Trad</b> The University of Sydney	
9:40-10:00 AM	Adoption of Agricultural Technologies in African Countries <b>Jackson Ryder</b> The University of Queensland	The Symmetries of Generalised Polygons <b>James Evans</b> The University of Western Australia	Uncertainty Quantification and Aerofoil Simulations <b>James Martini</b> Australian National University	
10:00-10:20 AM	Extracting insight into advection-dispersion processes through moment analysis <b>Ryan Watson</b> Queensland University of Technology	Schemes and their functors of points. <b>Alexander Lai De Oliveira</b> The University of Adelaide	Propulsion of Small-Scale Devices in Gas <b>Alexius Savvinos</b> The University of Melbourne	



<b>10:20-10:40 AM</b>	Hydrodynamic particle trapping in microvortices <b>Timothy Kay</b> The University of Melbourne	Measure Theoretic Definition of Black Hole Area <b>James Lawless</b> University of Wollongong	Fourier Optics, Hermite Functions and Prolates <b>William Roland-Batty</b> The University of Newcastle
<b>10:40-11:00 AM</b>	<b>MORNING TEA</b>		<b>Foyer</b>
	<i>Tute Room 1</i>	<i>Tute Room 2</i>	<i>Tute Room 3</i>
<b>Session chairs</b>	<i>Dr Graham Clarke</i> RMIT University	<i>Dr Grant Cairns</i> La Trobe University	<i>Dr Julia Collins</i> AMSI
<b>11:00-11:20 AM</b>	Free Products of Graphs <b>Max Carter</b> The University of Newcastle	Drawings of the complete graphs $K_5$ and $K_6$ , and the complete bipartite graph $K_{\{3,3\}}$ . <b>Emily Groves</b> La Trobe University	Do the rich get richer on Reddit? <b>John Davey</b> The University of Adelaide
<b>11:20-11:40 AM</b>	Convex hulls of graphs of structured bilinear functions <b>Mitchell Harris</b> The University of New England	A Topological Study of the Grothendieck-Teichmueller Group. <b>Adrian Hendrawan Putra</b> The University of Melbourne	Key Phrase Identification and Clustering in Internet Advertising <b>Anders Yeo</b> RMIT University
<b>11:40-12:00 PM</b>	Cayley graphs of finite semigroups <b>Daniel Glasson</b> RMIT University	Dynamics of Compound Droplets <b>Eliza Jones</b> Monash University	Detection of Australian Racism in Social Networks <b>Sajit Gurubacharya</b> Western Sydney University
<b>12:00-12:40 PM</b>	<b>LUNCH</b>		<b>Foyer</b>
<b>12:00-12:40 PM</b>	Bag Collection for Armidale and Newcastle students		
	<i>Tute Room 1</i>	<i>Tute Room 2</i>	<i>Tute Room 3</i>
<b>Session chairs</b>	<i>Dr Belinda Spratt</i> Queensland University of Technology	<i>Dr Georgy Sofronov</i> Macquarie University	<i>Dr Chris van Der Heide</i> The University of Queensland
<b>12:40-1:00 PM</b>	Rigid spheres and algebraically special solutions in General relativity <b>Daniel Sykes</b> The University of New England	Laplace Transform Approach to Pricing Convertible Bonds <b>Ngoc Lan Chi (Emma) Nguyen</b> University of Wollongong	A grid based particle method for solving hyperbolic curvature flows <b>Solene Hegarty-Cremer</b> Queensland University of Technology
<b>1:00-1:20 PM</b>	Gravitational Waves: A Mathematical Analysis <b>Chang Yu Wang</b> Monash University	Predicting behaviour of Financial Systems based on a multivariate GARCH perspective and Dynamical Network <b>Shidan Liu</b> RMIT University	Non-uniqueness and singularities in geometric partial differential equations <b>Jacque Omnet</b> The University of Queensland
<b>1:20-1:40 PM</b>	Symmetrisations and other rearrangement inequalities <b>Siksha Sivaramakrishnan</b> Monash University		A computational mathematics study of Disordered Analogues of Triply-Periodic Minimal Surfaces <b>Michelle Gardiner</b> Murdoch University



<b>1:40-1:50 PM</b>	Break Out & Student Voting	Foyer
<b>Session chair</b>	<i>Chloe Pearse</i> <i>Australian Mathematical Sciences Institute (AMSI)</i>	Tute Room 2
<b>1:50-2:20 PM</b>	Guest Speaker: Careers <b>Professor Tim Brown, AMSI</b>	Tute Room 2
<b>2:20-2:40 PM</b>	<b>DAY 2 WRAP UP</b>	<b>Tute Room 2</b>
<b>2:45 PM</b>	<i>Armidale and Newcastle students depart from International House to Melbourne Airport</i>	
<b>3.15 PM approx.</b>	<i>Armidale and Newcastle students arrive Melbourne (Tullamarine) Airport Departures</i>	
<b>2:40-3:15 PM</b>	Bag Collection	
<b>3:30 PM</b>	<i>All other students depart from International House to Melbourne Airport</i>	
<b>4:15 PM approx.</b>	<i>Arrive Melbourne (Tullamarine) Airport Departures</i>	

For speaker bios and project summaries please visit  
[vrs.amsi.org.au/current-projects](http://vrs.amsi.org.au/current-projects)