

Mathematics of Planet Earth Australia 2013: The Conference

SUMMARY PROGRAM

Time	Sunday 7 July			
18:00-18:30	Registration and welcome reception			
Time	Monday 8 July	Tuesday 9 July	Wednesday 10 July	Thursday 11 July
8:30	Registration			
9:00	Opening	Chris Budd Data Assimilation in weather forecasting	Robert Muir-Wood Saving lives and money – the second wave of Catastrophe modelling	David Karoly Modelling variations in extreme weather and climate events and understanding their causes
9:50	David H Bailey Conquering numerical error	Bronwyn Harch Data Science: informing insights, understanding and decision making relevant to Planet Earth	Simon Barry Managing Biosecurity for a Planet at Risk	Brian Kennett Imaging the Dynamic Earth
10:40	Morning tea			
11:00	John Cook The challenges of communicating the reality of climate change	David Fox Statistical Science for the Environment	Julie Arblaster Earth System Models - tools for understanding climate variability and change	Marc Parlange Land-atmosphere exchanges over complex terrain
11:50	Duncan Young The Australian Population Census – Shedding some light on who we are, what we do and building a brighter future for all Australians	Graeme Brown Measures of Australia's Progress: Measuring what is Important for National Progress	Peter Waterhouse Bioinvasion at the Molecular Level	Kate Evans Recent strategies and challenges for simulation and reproducibility in global climate modelling
12:40	Lunch			
13:30	Parallel Sessions Complex (and Dynamical) Systems Scientific Data Mining A Data-Based View of Our World	Parallel Sessions Jonathan Borwein Set the default to "Open" Gavin Huttley The state of reproducible computation in genomic biology Panel - Reproducibility in Computational Scientific Research	Parallel Sessions BioInvasion and BioSecurity Mitigating Natural Disaster Risk Sustainability – Environmental modelling Earth System Modelling A Data-Based View of Our World	Parallel Sessions Earth System Modelling Mitigating Natural Disaster Risk Realising our subsurface potential Scientific Data Mining
15:00	Afternoon tea			
15:30	Round table: Maths of Planet Earth	Parallel Sessions Sustainability – Environmental modelling Complex (and Dynamical) Systems Realising our subsurface potential Population censuses and the human face of Australia	Parallel Sessions BioInvasion and BioSecurity Mitigating Natural Disaster Risk A Data-Based View of Our World Earth System Modelling Sustainability – Environmental modelling	Parallel Sessions Earth System Modelling Mitigating Natural Disaster Risk Realising our subsurface potential Sustainability – Environmental modelling
End				
17:00		Poster session and networking drinks	MPE photography competition exhibition	Can maths save our planet? Panel discussion and Q&A
17:30			Public Lecture	Conference dinner, with dinner talk from Dr Alex Zelinsky
18:00				
18:30				
19:00				
20:00				
21:00				
22:00				

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Time	Friday 12 July
7:30	Registration
8:30	Mark Lawrence The new post-crisis paradigm for financial risk management
9:15	Mark Burgman Experts, judgment and the intelligence game
10:00	Johann van der Merwe Journey into uncharted territory: 'protecting the conservation values of a sensitive area'
10:45	Morning tea
11:15	PANEL: Talking risk: planning for the future
12:40	Lunch
14:00	Conference End

SESSION KEY

Themes	Colours	Sessions
A Planet Organised by Humans		Complex (and dynamical) systems Centre of Excellence for Mathematics and Statistics of Complex Systems and Australian Mathematical Society (MASCOS/AustMS) Complex systems model human economies and social structures, climate, nervous systems, cells and living things. They also model modern energy and telecommunication infrastructures.
		A data-based view of our world Statistical Society of Australia (SSAI) The ability to collect and store large data sets has led to the development of new techniques. This session explores these, and more traditional methods
		Population censuses and the human face of Australia Australian Bureau of Statistics (ABS) Using Census Spotlight, and the Dynamic Population Pyramid, the lectures will look at the statistical methodology behind the Census. Proudly supported by ABS .
		Scientific data mining Centre for Computer-Assisted Research Mathematics and its Applications (CARMA) Exploring the meaningful analysis of large data sets to discover relationships and present the data in novel ways that are compact, comprehensible and useful for researchers and practitioners.
A Planet at Risk		Earth system modeling Centre for Australian Weather and Climate Research, Centre of Excellence for Climate System Science and Bureau of Meteorology (ARC CoE CSS/BOM) Methods to effectively model computationally demanding data in areas such as climate, numerical weather prediction, data assimilation. An emphasis will be placed on community governance and distributed development.
		Mitigating natural disaster risk Geoscience Australia (GA) A natural hazard is not a disaster until it intersects with the community. How do we effectively predict the consequences and what can we do about minimising risks?
		Sustainability – environmental modelling Australia and New Zealand Industrial and Applied Mathematics (ANZIAM) The emphasis will be on local and regional-scale modelling. An important part of continent-scale modelling.
		Bioinvasion and biosecurity Commonwealth Scientific and Industrial Research Organisation (CSIRO) Introducing novel and open biological invasion situations, looking at the mathematics that is being used to study such phenomena.
A Planet to Discover		Realising our subsurface potential Geoscience Australia (GA) Australia currently has vast mineral and energy resources that many believe keep our economy strong. But where and what is the next big mineral deposit or energy source that will contribute to the resources 'pipeline' and our national economy?

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MONDAY 8 JULY — PROGRAM

MONDAY

Time			
8:30	Registration		
	Venue: Broadway 1		
9:00	Opening		
9:50	David H Bailey Conquering numerical error		
10:40	Morning tea		
11:00	John Cook The challenges of communicating the reality of climate change		
11:50	Duncan Young The Australian Population Census – Shedding some light on who we are, what we do and building a brighter future for all Australians		
12:40	Lunch		
	Venue: Carousel	Venue: 42nd Street	Venue: Phantom
13:30	Jessica Liebig Motifs in Bipartite Networks	Bishnu Lamichhane A mixed finite element method for approximating the solution of thin plate splines	Yanfei Kang A Shape Extraction and Classification Method for Atmospheric Time Series
14:00	Christopher Goddard Distance functions and tipping points	Rob Goudey Managing the Data Mine: The Quality of Scientific Data at the Environment Protection Authority Victoria	Danijel Belusic A data driven bottom-up approach for understanding the dynamics of the atmospheric boundary layer
14:30	Vera Roshchina Invisibility in mirror optics	Jay Larson Can We Model the Climate Directly?	Kerrie Mengersen Bayesian statistics for planet earth
15:00	Afternoon tea		
	Venue: Broadway 1		
15:30	Round table: Maths of Planet Earth		
17:00	End		

Mathematics of Planet Earth Australia 2013: The Conference

TUESDAY 9 JULY — PROGRAM

TUESDAY

Time				
8:30	Registration			
	Venue: Broadway 1			
9:00	Chris Budd Data Assimilation in weather forecasting			
9:50	Bronwyn Harch Data Science: informing insights, understanding and decision making relevant to Planet Earth			
10:40	Morning tea			
11:00	David Fox Statistical Science for the Environment			
11:50	Graeme Brown Measures of Australia's Progress: Measuring what is Important for National Progress			
12:40	Lunch			
	Venue: Broadway 1			
13:30	Jonathan Borwein Set the default to "Open"			
14:00	Gavin Huttley The state of reproducible computation in genomic biology			
14:30	Jonathan Borwein, Kate Evans and Gavin Huttley Panel - Reproducibility in Computational Scientific Research			
15:00	Afternoon tea			
	Venue: 42nd Street	Venue: Carousel	Venue: Phantom	Venue: Chorus Line
15:30	Johnathan Kool Modelling the spatial and temporal dispersal of marine larvae in Australian waters	B. S. Goh Management of biological populations without a good mathematical model of the natural dynamics	Richard Chopping Towards the quantification of Australia's subsurface resources	Sumonkanti Das An Overview of Poverty Mapping with Application to Bangladesh
16:00	Sergey A. Suslov Modelling the influence of ocean spray on hurricane wind profile	Boris Miller Control of flows on networks with the aid of Connected Markov Chains.	Marcus Haynes Synthetic thermal modelling emulator: a new tool in the realisation of our subsurface thermal potential	Phillip Wise Socio-economic Indexes for Areas (SEIFA): Making Sense of the Census
16:30	Vincent Lemiale Computational methods for deterministic modelling of geophysical hazards: application to landslides, flooding and tsunamis	Gary Froyland Transport in time-dependent dynamical systems	David Lescinsky Constructing basin-scale models of the subsurface: Evaluation of CO2 storage potential of the Petrel Sub-basin, NW Australia	
17:00	End			
17:00 - 18:00	Poster session and networking drinks Come together with all conference attendees to view the submitted posters, authors will be available to answer questions.			

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WEDNESDAY 10 JULY — PROGRAM

WEDNESDAY

Time					
8:30	Registration				
	Venue: Broadway 1				
9:00	Robert Muir-Wood Saving lives and money – the second wave of Catastrophe modelling				
9:50	Simon Barry Managing Biosecurity for a Planet at Risk				
10:40	Morning tea				
11:00	Julie Arblaster Earth System Models – tools for understanding climate variability and change				
11:50	Peter Waterhouse Bioinvasion at the Molecular Level				
12:40	Lunch				
	Venue: Phantom	Venue: Carousel	Venue: 42nd Street	Venue: Chicago	Venue: Chorus Line
13:30	Jonathan Keith A Bayesian agent-based model of the Brisbane fire ant invasion	John McAneney Natural Disasters, Economic Losses and Global Climate Change	Larry Forbes A Shearing Tale - the Kelvin-Helmholtz instability	Susan Rennie Kilometre scale weather prediction	Stuart Mead Determining change points in completeness of historical hazard event databases
14:00	Peter Caley Estimating the invasion success of introduced plants	Steven Lord Robust Decision-Making in Risk Management	Lynne McArthur Mathematical Modelling of the Environment – past and future projects	Terence O’Kane Metastability in the Southern Hemisphere Climate System	Sandra Johnson Developing a Sustainability Scorecard
14:30	Mary Myerscough Forager health and hive health: modelling the effect of external stresses on honey bee colony survival	Augusto Sanabria Combining observational and modelling studies to develop a map of Australian Fire Weather Potential	Dimetre Triadis Exact results for infiltration under ponded surface conditions	Michael Meylan Wave propagation in the Marginal Ice Zone	Murray Aitkin Modelling a terrorist network
15:00	Afternoon tea				
15:30	Jessica Dunn Spread and emergence in multiple host disease systems	Daniel McInnes Flood mitigation in dams via optimal control of Markov chains	Kate Saunders Modelling sea level rise effects in combination with storm surge and rainfall inundation in the Kakadu Flood Plains	Karsten Peters Modelling tropical convection with a stochastic multcloud model	Stephen Horn State Space Methods - a new paradigm for official statistics
16:00	Chuong Nguyen Physical models of insects for quarantine control	Mohammed T. M. Dawoud Investigating Extreme Precipitation Events over Istanbul: Statistical optimization and design guidelines	Philip Broadbridge Solutions for two-fluid flows in porous media.	Sofya Prakhova Novel Insolation Model for Climate Prediction	Lesley Wyborn Virtual laboratories: enabling reproducibility of collaborative scientific research
16:30	Daniel Heersink Modelling Total Larval Load of Aedes Notoscriptus at a Property Level in Brisbane, QLD Australia	Jane Sexton Open Source Software for a Disaster Resilient Community: Opportunities for Collaboration	Zhenzhen Chen Dynamical Behavior of Wastewater Models with Uncertainties	Todd Lane Thunderstorms and atmospheric waves	Jason Whyte Choosing between models for a time series? Data points us in the right direction!
17:00	End				
17:00	MPE photography competition exhibition				
	Venue: Broadway				
18:00 - 19:00	Public Lecture A Future Earth for our children: maths for the planet				

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THURSDAY 11 JULY — PROGRAM

THURSDAY

Time				
8:30	Registration			
	Venue: Broadway 1			
9:00	David Karoly Modelling variations in extreme weather and climate events and understanding their causes			
9:50	Brian Kennett Imaging the Dynamic Earth			
10:40	Morning tea			
11:00	Marc Parlange Land-atmosphere exchanges over complex terrain			
11:50	Kate Evans Recent strategies and challenges for simulation and reproducibility in global climate modelling			
12:40	Lunch			
	Venue: 42nd Street	Venue: Chicago	Venue: Carousel	Venue: Phantom
13:30	David Smith Applications of Ensemble Forecasting	Stephen Roberts High resolution tsunami inundation simulation using ANUGA	J. Florian Wellmann Information theory and the analysis of subsurface uncertainties	Nathan Clisby The importance of fast algorithms for simulating complex systems
14:00	Shayne McGregor Meridional movement of wind anomalies during ENSO events and their role in event termination	Jakir Hossen Time-Reverse Imaging of the Tsunami Source: 2011 NE Japan Case Study	Jerome Droniou Numerical approximation of a model involved in oil recovery processes	Kate Smith-Miles Optimisation of product and process design
14:30	Anthony Hirst The Australian Community Climate and Earth System Simulator (ACCESS)	Hannah E Power Wave Runup on East Australian Beaches: Model Accuracy and Applicability	Alison Kirkby Numerical Modelling as a predictive tool for identifying geothermal energy prospects	
15:00	Afternoon tea			
15:30	Ian Enting Communicating Climate Change Technicalities to Non-Mathematical Stakeholders	Gareth Davies Modelling tsunami hazards from earthquake sources	Nicholas Brown Constraining predictions of surface deformation using geodetic observations: Application to Coal Seam Gas Extraction	Tamsin Lee Is it extinct? That is the question
16:00	Lawrie Rikus Assessing the behavior of westerly jets in global reanalysis data sets	Roberto Benavente The Seismic W-phase and Earthquake Rupture Model Estimation	Hagen Schulte in den Baeumen Global Economic Impacts of Severe Space Weather	Kate Helmstedt Cost efficient fenced enclosures for conservation: large or small?
16:30	John Le Marshall Earth Observation from Space - Improving Specification of Current and Future Atmospheric State	Mahesh Parakash Scenario simulation modelling: Evaluation of Mitigation Strategies in Urban Environments	Chris Allen Anthropogenic Tectonic/ Earth-change: combining anthropogenic climate-biosphere-cryosphere-lithosphere-hydrosphere-sediment & asthenosphere change into a new unified hypothesis	Gary Froyland Origin, dynamics and evolution of ocean garbage patches from observed surface drifters
17:00	End			
	Venue: Bobby McGee's			
18:30 - 22:00	Conference dinner Dinner speaker: Dr Alex Zelinsky, DSTO			

Mathematics of Planet Earth Australia 2013: The Conference

FRIDAY 12 JULY — PROGRAM

Time	
7:30	Registration
	Venue: Broadway
8:30	Mark Lawrence The new post-crisis paradigm for financial risk management
9:15	Mark Burgman Experts, judgment and the intelligence game
10:00	Johann van der Merwe Journey into uncharted territory: 'protecting the conservation values of a sensitive area'
10:45	Morning tea
11:15	PANEL Talking risk: planning for the future
12:40	Lunch
14:00	Conference End

FRIDAY