

# 18<sup>TH</sup> IMACS WORLD CONGRESS MODSIM09



CAIRNS, AUSTRALIA  
13 –17 JULY 2009

## STREAMS AND COORDINATORS

### APPLIED AND COMPUTATIONAL MATHEMATICS

Roger Braddock, Griffith University

### BIOLOGICAL SYSTEMS

Bob Anderssen, CSIRO Mathematical and Information Sciences  
Markus Hegland, The Australian National University

### COMPUTER SCIENCES

Andrea Rizzoli, Istituto Dalle Molle di Studi sull'Intelligenza Artificiale  
David Swayne, Guelph University

### ECONOMIC AND FINANCIAL SYSTEMS

Michael McAleer, University of Western Australia  
Les Oxley, University of Canterbury, NZ

### ENGINEERING AND APPLICATIONS

Yaping Shao, University of Cologne  
Voratas Kachitvichyanukul, Asian Institute of Technology

### ENVIRONMENT AND ECOLOGY

David Pullar, University of Queensland  
Alexey Voinov, University of Vermont

### GLOBAL CHANGE

Mark Howden, CSIRO Sustainable Ecosystems

### PARTICIPATORY DECISION MAKING AND MODELLING SOCIAL SYSTEMS

Claudia Pahl-Wostl, University of Osnabrueck  
Blair Nancarrow, CSIRO Land and Water

### WATER RESOURCES

Shahbaz Khan, UNESCO  
Robert Argent, Bureau of Meteorology, Australia

The Congress will not be limited to these Streams. Expressions of interest are sought for potential session organisers from both IMACS and MSSANZ to suggest sessions outside of these streams.

## INTERNATIONAL CONGRESS ON MODELLING AND SIMULATION

Interfacing Modelling and Simulation with  
Mathematical and Computational Sciences

[www.imacs-modsim-world-congress.org](http://www.imacs-modsim-world-congress.org)  
[www.mssanz.org.au/modsim09](http://www.mssanz.org.au/modsim09)

## PARTICIPATING ORGANISATIONS



Université Libre de Bruxelles

## SPONSORS



MSSANZ and IMACS bring together a broad spectrum of scientists who apply various mathematical modelling, simulation, statistical, engineering, spatial and computer science methodologies and skills in solving practical problems coming from a wide range of endeavours including environmental and global change modelling, water resources management, health care, biological simulation and engineering. For them, the practical matter under investigation and the available data are the driving forces behind the methodology chosen for the task, or in developing techniques required to analyse new models.

Papers appearing in the proceedings may be selected for publication in special issues of the following journals post-congress:

- Applied Numerical Mathematics
- Mathematics and Computers in Simulation
- Environmental Modelling and Software

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## REGISTRATION

The registration fee includes opening reception, volume of abstracts, CD of proceedings, all lunches, morning and afternoon teas, Congress bag, pen and notepaper, access to all sessions and the Congress dinner. Registration fees are GST-inclusive.

### EARLY BIRD

- Student \$450
- Non-student \$750

**Cut-off date Friday 13 March 2009.**

### REGULAR

- Student \$550
- Non-student \$850

Payment required prior to publication in the Congress Proceedings. Proof of student status must be supplied to obtain the discounted student rates.

## STUDENT PRIZES

All student authors are eligible to be assessed for student prizes.

## CONGRESS DEADLINES

<b>Abstracts submitted</b>	Saturday 28 November 2008
<b>Acceptance of abstracts</b>	Friday 19 December 2008
<b>Final papers submitted</b>	Friday 13 March 2009

## CALL FOR SESSIONS

Suggestions for sessions may be made under one of the Streams of the Congress. Other sessions not aligned with a Stream, may also be suggested by participants. These should fit within the broad theme of the Congress. People wishing to offer a session should provide a description containing:

- name of the Stream
- title of session
- name of session organiser and email address
- and a paragraph describing the range and scope of the proposed session.

These should be forwarded to Roger Braddock – R.Braddock@griffith.edu.au

## PAPER SUBMISSION AND REVIEW

The paper submission review process and registration payments will be handled exclusively using WCMT, an on-line conference management tool. WCMT will be accessible through the Congress website.

## PLENARY SPEAKERS

### PROFESSOR NATASHIA BOLAND

University of Newcastle, Australia, **Operations Research**

Natashia Boland is Professor of Mathematics at the University of Newcastle, a position she took up in 2008 after 13 years at the University of Melbourne. Professor Boland has research interests in integer programming, column generation, constrained shortest paths and transportation and logistics. Her applications are wide ranging including open-pit mine scheduling, airline planning, and international shipping. She has research collaborations with BHP-Billiton and CTI Pty Ltd.

### PROFESSOR JON CHAPMAN

Oxford University, **Applied Mathematical Modelling**

Jon Chapman held positions at Stanford and Oxford, before becoming a Royal Society University Research Fellow in 1995 and the Oxford Professor of Mathematics and its Applications in 1999. His research interests centre on mathematical modelling and asymptotic analysis for applications in industry and the physical and biological sciences. He has been awarded the SIAM Richard C. DiPrima prize, the Whitehead Prize of the London Mathematical Society, and the inaugural SIAM Julian Cole Prize.

### PROFESSOR FRANK DE HOOG

CSIRO Mathematics and Information Sciences, **Industrial Mathematical Modelling and Simulation**

Frank de Hoog is a mathematical scientist with extensive research and teaching experience. He has contributed to topics in the numerical solution of differential and integral equations, numerical transform techniques, computational linear algebra, solid mechanics, vibration of structures, stress analysis and rheology. A key feature of Frank's work is that it has involved extensive collaboration within university and industry sectors including Geologics, BHP, Comalco, Bluescope Steel, James Hardie, Caltech, and TU Eindhoven.

### PROFESSOR GEORGE HORNBERGER

University of Virginia, **Hydrologic Context for Modelling Nutrient Cycles**

George Hornberger is Ernst H Ern Professor of Environmental Sciences at the University of Virginia. He is a Fellow of the Geological Society of America and the American Geophysical Union and an elected member of the National Academy of Engineering. His research focuses on understanding how hydrological and geochemical processes combine to produce observed stream dynamics. His current research on dissolved organic carbon dynamics extends modelling from individual catchments to regional scales.

### PROFESSOR TERRY MILLS

La Trobe University Bendigo, **Mathematical Modelling in Health Care**

In 1975, Terry Mills was appointed to Bendigo Institute of Technology as a Lecturer after completing a PhD at the University of Florida. He was promoted to Professor of Mathematics at La Trobe University in 1993 and is now an Emeritus Professor. Since 1998 he has been an honorary Senior Research Fellow at Collaborative Health Education and Research Centre at Bendigo Health. This gives him the opportunity to apply ideas from mathematics to problems from Bendigo Health.

## CAIRNS, NORTH QUEENSLAND

Cairns is a true tropical paradise in a unique environment – the only place in the world adjacent to two world heritage-listed attractions, namely the Great Barrier Reef and the Wet Tropics Rainforest. July sees a dry temperate climate, with an average of seven hours sunshine per day and a diurnal temperature range of 16 to 25°C (61 to 77 °F).

The congress may include a 'breakout half-day' to take advantage of the many scenic attractions, including a cruise to Green Island, the Skyrail/train circuit to the mountain village of Kuranda, and a tour of the rainforest areas.

## VENUE AND ACCOMMODATION

The Congress will be held at the Cairns Convention Centre, a world class meetings venue adjacent to both the town centre and the cruise terminals. This venue has a non-smoking policy.

A range of accommodation options are available within a few minutes walk of the Congress venue.

The city centre is only 10 minutes away from the international airport.

## INTERNATIONAL ADVISORY COMMITTEE

- Robert Vichnevetsky, Rutgers University
- Tony Jakeman, The Australian National University
- Herman Brunner, Hong Kong Baptist University
- John Butcher, University of Auckland
- Murray Cameron, CSIRO Mathematical and Information Sciences
- Peter Deuffhard, Zuse Institute Berlin
- Giorgio Guariso, Milan Polytechnic
- Elias Lipitakis, Athens University of Economics and Business
- Kerrie Mengersen, Queensland University of Technology
- Helena Mitsova, North Carolina State University
- Kimio Morimune, Kyoto University
- Hugh Possingham, University of Queensland
- Robert Russell, University of New Hampshire
- Will Steffen, The Australian National University
- Paul Sullivan, University of Western Ontario
- Pauline van den Driessche, University of Victoria
- Robert Vertessy, Bureau of Meteorology, Australia
- Alex Zelinski, CSIRO Information and Communications Technologies Centre, Australia

## SCIENTIFIC PROGRAM CO-CHAIRS

- Bob Anderssen, CSIRO
- Roger Braddock, Griffith University

## ORGANISING COMMITTEE

- David Mayer, Department of Primary Industries and Fisheries, Qld
- Neil Gribble, Department of Primary Industries and Fisheries, Qld
- Lachlan Newham, The Australian National University
- David Post, CSIRO Land and Water
- Susan Cuddy, CSIRO Land and Water
- Tony Weber, BMT WBM Pty Ltd
- Michael Atzeni, Department of Primary Industries and Fisheries, Qld
- Georgina Pitt, Department of Natural Resources and Water, Qld
- Susan Kelo, The Australian National University

## RELATED CONGRESS

Pacific Rim Mathematical Association Congress, Sydney 6-10 July 2009, [www.primath.org](http://www.primath.org)



Cairns Esplanade  
Courtesy of CCC

## IMACS

The International Association for Mathematics and Computers in Simulation has been active for 52 years, and has run the very successful IMACS series of congresses, principally in the northern hemisphere. The society has stimulated and fostered interest in quantitative techniques and their application to real-world problems. [www.research.rutgers.edu/~imacs/](http://www.research.rutgers.edu/~imacs/)

## MSSANZ

The Modelling and Simulation Society of Australia and New Zealand Inc. has been active since 1974, and has run the previous 17 MODSIM Congresses in Australasia. The society represents modellers with interests in using quantitative methods to manage practical problems in industry, environment, science, societal and economics areas. [www.mssanz.org.au/](http://www.mssanz.org.au/)