NEWSLETTER

MODELLING & SIMULATION SOCIETY OF AUSTRALIA
AND NEW ZEALAND INC (MSSANZ)

The Society for Computer Simulation International

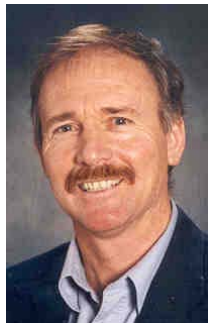**International Association for Mathematics and Computers in Simulation**

Japan Society for Simulation Technology

URL: http://mssanz.cres.anu.edu.au

June, 2002

PRESIDENT'S COLUMN

This is probably our only Newsletter for 2002 given that email and the MSSANZ website are being increasingly used as communication vehicles for the Society. Nevertheless it still fulfills a very important function by drawing together a range of information for perusal at your leisure. Please feel the urge to pass it on to non-members who may be interested in our news.

This issue begins with an update of details for the upcoming 15th Biennial Meeting of the Society, MODSIM 2003, to be held in Townsville in July 2003. David Post has a very competent and hardworking local organising committee which is providing a conference service of a very high standard. What David needs from our members is a dedicated band of session organisers. Please do contact David to discuss ideas you have for special sessions at MODSIM 2003. Convening a session is an excellent way of establishing and/or maintaining your research and industry networks and, if of sufficient quality, could warrant publication of revised conference papers for refereed journals.

Next in the issue is the Opening Address of MODSIM 2001 by ANU Deputy Vice-Chancellor, Professor John Richards. This is followed by a fulsome report from Fred Ghassemi on that Conference. On behalf of all of you I offer our deepest thanks and congratulations to Fred and Susan Kelo for the excellent standard of the MODSIM 2001 organisation and of the Proceedings. I cannot recall a higher quality set of Proceedings volumes anywhere, both in terms of the research quality and the production consistency.

MSSANZ has been awarding Biennial Medals and student awards since 1995, one in each category of natural, socioeconomic and general systems. In 1999 we commenced awards for Fellows and last year we introduced Early Career Research Excellence awards. Vice-President, Michael McAleer who has been a champion of the introduction and implementation of these new awards deserves our thanks.

The successful candidates for all these awards are profiled in this newsletter. Congratulations to all the winners. There is strong competition for every award, especially among the students. This is very satisfying in that it reflects a culture of increasing excellence in MSSANZ and a widespread dedication to its aims.

Looking forward to seeing you again in the warmer climate of Townsville next June.

Tony Jakeman
President of MSSANZ

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INTERNATIONAL CONGRESS ON MODELLING AND SIMULATION

MODSIM 2003

CALL FOR PAPERS

Theme:
Integrative Modelling of Biophysical, Social and Economic Systems for Resource Management Solutions

Venue:
Jupiters Hotel & Casino, Townsville, Australia
Date: 14-17 July 2003

As you will have noticed, accompanying this newsletter is the brochure advertising the next MSSANZ Congress – MODSIM 2003, which will be held in sunny Townsville from 14-17 July 2003. Although MODSIM Congresses are traditionally held in December, we decided to hold this one in July in order to take advantage of the absolutely beautiful weather in Townsville at this time of year.

Because of the early start, the deadlines will be different this year – abstracts are due 29 November 2002, with full papers due 28 February 2003. The cheaper 'early-bird' registrations also end on 28 February 2003, so be sure and plan ahead!

Submission of abstracts and papers this year will be entirely digital, so be sure and visit the Congress website, http://mssanz.cres.anu.edu.au/modsim2003.html for information on how to submit and register.

Finally, being a small tropical city, accommodation options in Townsville are not as extensive as those in other cities where MODSIM has been held previously, so be sure and book your accommodation early! Staying at the Congress venue, the sumptuous Jupiters Hotel and Casino (http://www.jupiterstownsville.com.au/index.html) is highly recommended for those who can afford it. A range of cheaper hotels are also available and information on these can be found on the Congress website.

I look forward to greeting you in Townsville in July 2003!

David Post
MODSIM 2003 Convener

CALL FOR PAPERS ON:

- Water resources, oceanography, climate and the atmosphere
- Global change, ecology, agriculture, forestry, and fisheries
- Socio-economic systems, demography, business and tourism
- Econometrics, economics, statistics, finance, risk and uncertainty
- Information systems, decision analysis and computing
- Industrial, mining and operation research
- Medical research, public health and epidemiology
- General aspects of modelling and simulation

Note that selected papers will be invited for publishing in international journals.

DEADLINES

Abstracts (300 words) by 29th November 2002
Acceptance of abstracts by 20 December 2002
Final papers (6 x A4) by 28th February 2003

REGISTRATION

MODSIM 2003 Entitlements
Registration entitles participants to the opening reception, bound proceedings or CD, lunches, morning and afternoon teas, a Congress bag, pen, notepad, access to all sessions and the Congress dinner.

Fees
Registration fee (which includes 10% goods and services tax) before 28 February 2003:

MSSANZ members (AUD$650)
Non-members (AUD$720)
Students* (AUD$395)

Registration fee (which includes 10% goods and services tax) after 28 February 2003:

MSSANZ members (AUD$750)
Non-members (AUD$820)
Students* (AUD$495)

*** Students should provide a certificate from their University administration confirming their full-time enrolment.**

Registration Process
Registrations will need to reach the congress secretariat **by COB on 30th May 2003**. It will be possible to register by submitting a downloadable form which will become available from the Secretariat shortly.

For further information contact:

Congress Secretariat
Dr David Post
CSIRO Land and Water
Davies Laboratory
PMB PO Aitkenvale
QLD AUSTRALIA 4814
Phone: +61 7 4753 8605
Fax: +61 7 4753 8650
Email: David.Post@csiro.au
URL:http://mssanz.cres.anu.edu.au/modsim2003.html

MODSIM 2001 CONGRESS OPENING ADDRESS BY

Professor John Richards

Distinguished Guests, Ladies and Gentlemen*,*

It is my very great pleasure to welcome you to the Australian National University, and to say how pleased we are that you have chosen ANU as the venue for your congress on this occasion.

I understand this is your 14th biennial meeting, the first having been in 1976. I also understand that there are some 400 of you taking part in the meeting, and that almost 40% of the 350 or so papers being presented are from our overseas visitors.

A quick calculation shows that with so many papers over four days you just have to have parallel sessions, as of course you do. I notice that you will have six themes running at any one time, in itself an excellent indicator of both the interest in simulating the behaviours of physical, biological, economic and other natural systems, and also the variety of applications in which the Modelling and Simulation Society of Australia and New Zealand takes an interest. If my experience with such major and diverse conferences is anything to go by, then you have a challenge ahead of you resolving which of those parallel sessions, competing for your interest at any given time, that you will attend!

As an engineer I have always had an interest in modelling the real world, and using models to simulate behaviours. I am also interested in how modelling has evolved.

Early on, of course, our models were extremely simple and often were called laws – such as Hooke's Law, Ohm's Law, Boyle's Law, and so on. Nevertheless models they are. They are the fit of a simple mathematical description to observations about nature that allows us subsequently to make predictions about how more complex arrangements behave.

And of course, from an engineering standpoint, well-modelled systems, leading to an understanding of fundamental behaviours, allows us to design and synthesise newer systems still.   Identification of system behaviour through the development of an effective model is at the heart of design as it is also behind the ability to control systems – whether that be explicit control in the form of making aircraft stable in flight, or more long term control such as the development of flood and salinity mitigation through models of watershed behaviour.

In my field, which is *electrical* engineering, it was not long before more detailed models were devised for the components that constitute an electrical system. The circuit model of a transistor comes to mind, as does the circuit models for motors, generators and transformers, all of which let us understand how those physically-complicated devices behave when used in real applications.

In the case of the transistor, the models were and still are referred to as *equivalent circuits*, but models they are, in which the behaviour of the transistor is captured through representing it by a collection of the models for the simpler components we already know about. A collection of transistor models and those for other electronic components are now incorporated into quite sophisticated circuit simulation packages that are used right through the semiconductor industry to assist in the design of the electronic systems with which we are entertained, communicate and compute.   And, of course, having developed computers using electronic models and circuit simulation programs, we can now use those same computers to assist in operating the sorts of models you will be discussing in this Congress.

I had a very salient lesson in what can go wrong with the accuracy of models when I was doing my PhD. Let me first of all, though, talk about the difference between precision and accuracy.

I often find that there is a tendency to make models too precise for the application intended. Indeed, with some of my students over the years I have had to dissuade them from representing every detail and nuance in the system they are representing because the subsequent simulations don't warrant it – often a simple approximation will yield results at the level of detail needed.

To illustrate this point consider how we might simulate the interaction of electromagnetic energy with natural features, such as a tree in a forest. This problem arises when we need to understand images of the earth's surface recorded from spacecraft using radar technology.   In radar imaging, energy is transmitted from a spacecraft to the earth's surface and scattered back to the platform. By measuring how much energy is scattered from each point on the surface in a given region it is possible to build up an image of the features in the region. The technology is particularly suited to forest applications because there is good evidence that we can assess forest biomass by using the microwave energy in spaceborne radars.

To understand how a tree responds to the incoming microwave energy we build a physical model of the tree and use it to simulate backscattering. That work has been going on now for about two decades. Often the tree model can be as crude as a single vertical dielectric cylinder representing the trunk, but sometimes it needs to account for the branches and foliage as well. Whether it does or not depends upon the application and the degree of precision required;

but rarely does it need to incorporate the detail of an individual leaf. So suiting model precision to the results required is an important design consideration in simulation studies.

But let me turn to my PhD – that problem had to do with accuracy rather than precision, as a result of which I now know the value of π to 15 decimal places!

I was modelling the behaviour of ions in a dynamic mass spectrometer. The ion motion in that device is described by a particularly interesting set of differential equations whose solutions can be stable or unstable. A very tiny change in one of the parameters in the model can tip the system from stability to instability. Indeed that is how the device separates ions of different mass.

I set about writing a computer model for the instrument, with which I simulated its operation. While I was very happy with the precision of the modelling, in that I had taken account of all the significant physics and physical elements of the instrument, my results were all over the place. To cut a long story short, the problem had to do with the accuracy of the arithmetic being used in my Fortran computer program.

As those among you who are Fortran experts might know, I could specify either single precision or double precision arithmetic in my program. As I recall, the former stored numbers with eight decimal place accuracy, whereas double precision used 15 places. Once I swapped to double precision and thus represented the numbers in the simulation to greater accuracy my problem was solved. The by-product was that I wrote π many times in double precision arithmetic that it is permanently stored in my memory to 15 decimal places!

My interests now are to do with understanding the information we can derive and use about the earth's surface using fundamental data gathered by spacecraft and aircraft platforms. The primary data gathering task is called *remote sensing*, and the decision support systems built around that type of data are loosely called *geographic information systems* (GIS). Using the varieties of data available in a GIS we can analyse patterns of land use, determine areas of land under cultivation, determine watersheds, map natural disasters and analyse environmental impact, to name a few.

At the heart of the GIS is a large spatial data base containing many planes of data. Sitting above the data base will be some form of data management system, but more importantly, from the perspective of this Congress, there will be a model that the user constructs which exploits the available data to simulate patterns of land use, or to explore environmental impact, or to produce fuel maps in bush fire control, and so on. Much of the modelling will involve image analysis or understanding, in which the raw numerical data is turned into labels that tell us what we want to know about each spot (or pixel)

on the ground. But I think most GIS developments have been severely limited by the tendency of each analyst agency to construct its own complete spatial data base. Since we now have electronic connectivity, via the Internet, involving all data providing agencies, I am firmly of the view that the most appropriate GIS is one where the data sets are left with the primary agencies and in which the user purchases data on-line as and when required. Once a particular project is finished the user should then disconnect.

Provided data costs are reasonable, this has to be a more effective means for accessing well-maintained and timely data. After all, the data gathering agency is the expert for that particular data type – and that expertise will, with time, undoubtedly extend to the production of derived or geophysical products for sale to the user rather than just the raw data.

In the GIS context that will shift the emphasis from models that work with data to models that work with labels – still to be manipulated and integrated – to produce the required outputs. The analyst then must learn to integrate the labels available for the region of interest. One set of labels might indicate broad cover types such as vegetation, soil and water, whereas a different set, coming from the data recorded by a different sensor (radar) might describe the geometry of the region as, say, rough and smooth. Yet another set of labels might indicate soil type, such as clay, sand or loam. The challenge for the analyst is to have enough knowledge to combine the geophysical labels to conclude that what is being imaged is a particular crop type. The GIS model the analyst uses must be able to cope with labels rather than data, and must have enough in-built intelligence to know how to form inferences from sets of labels.

What does that mean for modelling and simulation? Well, I think we will see more models based on artificial intelligence and expert systems as a result of the need to model human knowledge and decision processes, because that's where the in-built intelligence comes from.

Perhaps I should leave my thoughts there but I hope they might provoke some discussion during the next four days.

I have jumped a round a little in the examples I have chosen to illustrate my interests in modelling and simulation, but of course is that nature of the challenge – modelling and simulation belongs almost to every field of scientific inquiry. The enormous range of papers you have included in your program, covering so many fields, indicates your mutual interests in problem solving, a desire to share experiences and to learn. I have already seen your Proceedings – all 4 volumes. They illustrate the cross fertilisation of ideas and methods that will flow from this meeting and will also, of course, comprise part of the long term record of Australian and international research on modelling and simulation.

Please accept my very best wishes for a highly successful meeting. As much as what you learn, I hope the friendships and networks you establish will be valuable and long-lasting. If you are from out of town I trust you will also have time to see something of Canberra, and of our University.

Let me finish by congratulating all who have been involved in the planning and running of the Congress, and pay tribute to those who will contribute to its success in other ways, including the speakers, authors and, of course, those who peer reviewed your papers. You look to have a wonderful week ahead of you.

It is therefore my very great pleasure now to declare open MODSIM 2001.

MODSIM 2001 INTERNATIONAL CONGRESS ON MODELLING AND SIMULATION, The Australian National University, Canberra, ACT,

Overview

The 14th Biennual Congress of MSSANZ took place at the Australian National University (ANU), from 10-13 December 2001. This was the third time the meeting was held at ANU. The two previous Congresses were in September 1978 and September 1989 respectively. The theme of the MODSIM 2001 Congress was "Integrating Models for Natural Resources Management across Disciplines, Issues and Scales".

Following the welcome address by the Convener (Dr Fred Ghassemi) and the President of the Modelling and Simulation Society of Australia and New Zealand Inc. (Professor Tony Jakeman), Professor John Richards (Deputy Vice Chancellor of the Australian National University), opened the Congress. In his address he described his personal experience in modelling and simulation of real world problems and noted that these days modelling and simulation belongs in almost every field of scientific inquiry. The full text of his speech is reproduced in this Newsletter.

The Congress consisted of 43 technical sessions in Natural Systems, Socioeconomic Systems and General Systems. These sessions were organised by 50 well known modellers from Australia, New Zealand, Japan, Switzerland, France and Singapore. I take this opportunity to thank them all for doing such an excellent job in inviting contributors as well as reviewing the submitted abstracts and papers.

Six eminent keynote speakers from Australia, the United States of America, the United Kingdom and France addressed the Congress. On each of the first three days, two of them made presentations. The keynote speakers' names, affiliations and the titles of their presentations were as follows:

-   **Professor Hugh Possingham**, University of Queensland, Australia
    Models, Problems and Algorithms: Perceptions about their Application to Conservation Biology.

-   **Professor Clive Granger,** Department of Economics, University of California, San Diego, United States of America

    Specifications of Linear and Nonlinear Models: Methodological Implications.
-   **Professor Louise Heathwaite,** Department of Geography, University of Sheffield, United Kingdom
    Modelling Nutrient Export from Agricultural Land: Approaches, Scales and End-Users.

-   **Professor Ann Harding,** National Centre for Social and Economic Modelling (NATSEM), University of Canberra, Australia
    New Advances in Microsimulation Modelling: Improving Social and Economic Policy

-   **Professor Tony Jakeman,** Centre for Resource and Environmental Studies, The Australian National University, Canberra, Australia
    Integrated Assessment and Information Systems for Catchment Management

-   **Dr Francois Bousquet,** Centre for International Research in Agriculture for Development (CIRAD), Montpellier, France
    Multi-Agent Simulations and Ecosystem Management

The Editorial Committee reviewed and accepted 447 abstracts. Subsequently some 347 papers with 730 authors and co-authors were published in the Congress Proceedings of 2178 pages in four volumes. All papers were peer reviewed and edited before being accepted for publication in the Congress Proceedings. Volume titles and editors were:

Volume 1: Natural Systems (Part One)
Editors: Fereidoun Ghassemi, David Post, Murugesu Sivapalan and Robert Vertessy

Volume 2: Natural Systems (Part Two)
Editors: Fereidoun Ghassemi, Peter Whetton, Richard Little and Mark Littleboy

Volume 3: Socioeconomic Systems
Editors: Fereidoun Ghassemi, Michael McAleer, Les Oxley and Michelle Scoccimarro

Volume 4: General Systems
Editors: Fereidoun Ghassemi, David White, Susan Cuddy and Toshio Nakanisi

Presentations of the 347 papers took place in 6 parallel sessions in 6 Lecture Theatres at the

Manning Clark Centre. In each lecture Theatre a trained helper assisted speakers in making their presentations using PowerPoint, overhead or slide projectors.

Figure 1 shows a breakdown of the papers. It indicates that 214 papers (62%) derived from various states and territories in Australia while the remaining 133 papers (38%) came from overseas.
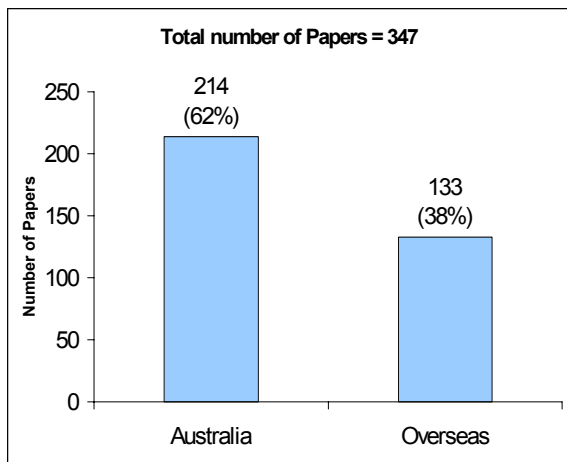

Figure 1: Breakdown of the 347 papers.

Figure 2 demonstrates the national breakdown of the 133 overseas papers. It shows that Japan contributed most, with 32 papers or 9 % of the total submitted papers. It is followed by the United States (21), New Zealand (18), United Kingdom (10), the Netherlands (7), France (7), Germany (6) and Switzerland (5). The remaining 27 papers emanated from 10 other countries. Overall the Congress enjoyed Contributions from 25 countries.
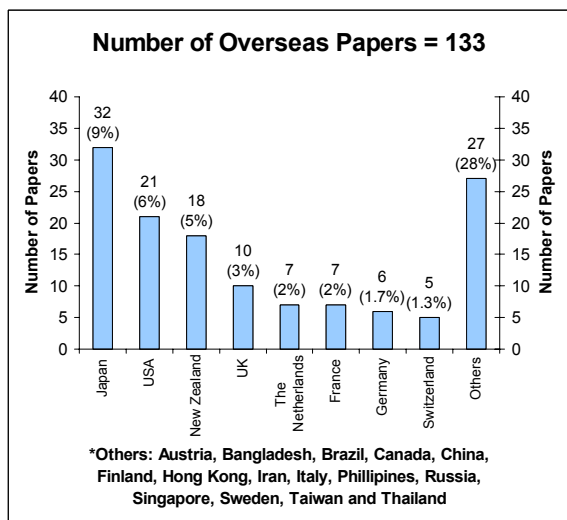

Figure 2: National breakdown of the 133 overseas papers (percentages are with respect to 347 papers).
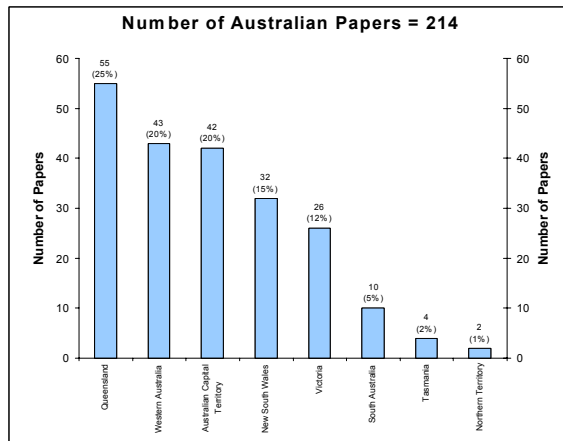

Figure 3: State and territory breakdown of Australian papers (percentages are with respect to 214 papers).

Figure 3 presents the breakdown of papers submitted according to various Australian States and Territories. It shows that Queensland contributed the most, with 55 papers (25% of the Australian papers). It is followed by Western Australia (43), Australian Capital Territory (42), New South Wales (32), Victoria (26), South Australia (10), Tasmania (4) and the Northern Territory (2).

Because the Congress was held in the Australian Capital Territory, Table 1 shows breakdown of the 42 papers submitted from various institutions in this territory. It indicates major contributions from the Australian National University and two CSIRO divisions.

Table 1: Breakdown of the 42 Australian Capital Territory's papers.

No.	Institution	Number of papers
1	The Australian National University - CRES[1]/iCAM[2] (13) - RSSS[3] (1)	14
2	CSIRO[4] Land and Water	11
3	CSIRO[4] Sustainable Ecosystems	9
4	Bureau of Rural Sciences	5
5	Australian Defence Force Academy	2
6	Private Consultant	1
Total		42

[1] Centre for Resource and Environmental Studies, [2] Integrated Catchment Assessment and Management Centre, [3] Research School of Social Sciences, [4] Commonwealth Scientific and Industrial Research Organisation.

The Congress Reception was held on Monday 10 December between 5:30 and 7pm at University House Gardens. It was a beautiful, sunny evening. Professor Bob Wasson Director of the Centre for Resource and Environmental Studies, addressed the audience. The Concert Band of Lyneham High School provided music. On this occasion, in order to

recognise the contributions of the 50 session organisers, each one of them received a ballpoint pen in a very nice jarrah box with their names carved both on the pen and the box.

The Congress dinner which was held at the Rydges Hotel (formerly Lakeside Hotel) on 12 December between 7:30 and 10:00 pm was another warm and happy gathering. The Lyneham High School Jazz Band were widely appreciated for their playing from 7:30 to 9. On this occasion Professor Tony Jakeman President of MSSANZ presented the following awards to their recipients:

Biennial Medals

- Professor Murugesu Sivapalan (Natural Systems)
- Professor Clive Granger (Socioeconomic Systems)
- Professor Peter Young (General Systems)

Fellowships

- Dr Sylvia Esterby (Natural Systems)
- Professor Les Oxley (Socioeconomic systems)
- Professor Toshio Nakanishi (General Systems)

Early Career Research Excellence Awards

- Jan Herbert and Dr David Mayer (Natural Systems)
- Drs Romy Greiner and Christine Lim (Socioeconomic Systems)
- Drs Andrea Rizzoli and Robert Argent (General Systems)

Student Prizes ($500)
- Tim Harrold (Natural Systems)
- Felix Chan (Socioeconomic Systems)
- Rebecca Letcher (General Systems)

Student Commendations for Excellence

- Suhejla Hoti (Socioeconomic Systems)
- Gavin Bowden (General Systems)

The Congress closed on Thursday 13 December after lunch at 2 pm. It was followed by a workshop (organised by Susan Cuddy from CSIRO Land and Water in Canberra) on the Integrated Catchment Management System on Friday 14 December and attended by 14 modellers.

Overall, the Congress achieved its objectives and I am pleased to say that a large number of participants considered it as the best MODSIM Congress organised so far. In this respect I would like to thank Susan Kelo for her contributions as the administrator of the Congress. I hope to be with you in Townsville in July 2003 for the next MODSIM Congress (MODSIM 2003).

Fereidoun (Fred) Ghassemi,
Convener of the MODSIM 2001 Congress

BIOGRAPHICAL SKETCH OF THE MSSANZ BIENNIAL MEDALISTS FOR 2001

1. Professor Murugesu Sivapalan
 NATURAL SYSTEMS CATEGORY

Professor Sivapalan's area of specialisation is Surface Hydrology. Trained as a Civil Engineer with a BScEng (Hons) degree from the University of Ceylon, Peradeniya (1975), he later obtained the MEng degree in Water Resources Engineering from the Asian Institute of Technology (1977), and the MA (1983) and PhD (1986) degrees in Civil Engineering from Princeton University. He joined the Centre for Water Research, the University of Western Australia as a Lecturer in 1988, and was promoted to the position of Professor of Environmental Engineering in 1999. In 1995-1996, Dr Sivapalan was the Lise Meitner Fellow at the Vienna University of Technology. In 2000-2001, he was Visiting Professor at the Delft University of Technology, and the Vienna University of Technology. Dr Sivapalan has also worked for three years as a consulting engineer in Nigeria (1978-1981), and as a research associate at Princeton University (1986-1988).

Professor Sivapalan is a world leader in the field of catchment hydrology. The principal focus of his current research is "prediction of ungauged catchments", and has made fundamental contributions to scale issues in modelling, process controls on regional flood frequency, the development of a new theory of hydrology at catchment scale, and the effects of climatic and land use changes on water balance and water quality. He has a substantial publication record, with one edited book, over 65 articles in refereed international journals, and 35 papers in conference proceedings. Prof. Sivapalan is on the editorial boards of 4 journals, and is an Associate Editor of the Encyclopaedia of Hydrological Sciences. He was co-convenor of two prestigious international workshops on "scale problems": Robertson, NSW (1993), and Vienna (1996). He was co-convenor of many special sessions at AGU and EGS meetings and at two MODSIM Congresses. Professor Sivapalan has been elected a Life Member of the International Water Academy (Oslo, Norway), and as Fellow of the Australian Academy of Technological Sciences and Engineering. He has been awarded the Biennial Medal by MSSANZ in 2001 and was also made a Fellow.

2. Professor Clive Granger
SOCIO-ECONOMIC SYSTEMS CATEGORY

Professor Granger obtained his Bachelor of Arts in 1955 from The University of Nottingham. He also has a PhD from the University of Nottingham, 1959. He began his career as an Assistant Lecturer/Lecturer of Statistics, University of Nottingham from 1954 to 1956. Since 1974 he has been the Professor of Economics, the Chair, Department of Economics, University of California at San Diego,. Other positions include Professor of Applied Statistics & Mathematics, University of Nottingham, 1982-84, Head, Department of Economics, University of Nottingham, 1964-74 and Assistant Lecturer/Lecturer of Statistics, University of Nottingham, 1956-64. He is now also a Fellow of MSSANZ.

3. Professor Peter Young
GENERAL SYSTEMS CATEGORY

Following a student apprenticeship with English Electric Aviation (now British Aerospace) and a first class honours degree in aeronautical engineering at Loughborough University, U.K., Peter Young obtained an M.Sc. degree at Loughborough. He was then awarded a Whitworth Fellowship and obtained MA and Ph.D degrees from Cambridge University, U.K., in 1970. He also became a chartered engineer, and was elected to membership of the Royal Aeronatical Society, the Institution of Mechanical Engineers, and the Institution of Electrical Engineers. He worked as a civilian scientist for the United States Navy at China Lake in California from 1968 to 1970, returning then to Cambridge, first a Senior Industrial Fellow employed partly by Imperial Chemical Industries, and then as a University Lecturer in Control Engineering and Fellow of Clare Hall, Cambridge. At this time, the focus of his research changed from control and systems engineering to environmental systems; and this led, in 1975, to his appointment as Professorial Fellow and Head of the Environmental Systems Group in the new Centre for Resource and Environmental Studies (CRES) at the Australian National University (ANU), Canberra.

In 1981, he returned to the UK to Head the Department of Environmental Science from then until 1987, at which time the Department was graded at the highest level in research by the Government's Earth Science Review Committee. Since 1987, Peter Young has continued his life-long research on the statistical identification and estimation of 'data-based mechanistic' (DBM) models of stochastic, dynamic systems in areas ranging from ecology to macro-economics, His latest research has concentrated on novel state dependent parameter (SDP) models of nonlinear stochastic systems, including their use in control system design, state estimation and forecasting. Current applications research is continuing in many areas including rainfall-flow modelling and flood forecasting; the modelling and control of inter-urban road traffic systems; imperfect mixing in mass and energy transfer and the development of methods for estimating human impact on environmental systems (the EEC IMPACT Project). Since 1987 he has been Director of the Centre for Research on Environmental Systems and Statistics at Lancaster; and he is Adjunct Professor of Environmental Systems in CRES at the ANU.

BIOGRAPHICAL SKETCH OF THE MODSIM 2001 STUDENT PRIZE WINNERS

1. Rebecca Letcher
GENERAL SYSTEMS CATEGORY

Rebecca Letcher's degrees consisting of: Bachelor of Science, Honours (1st Class) and Bachelor of Economics were undertaken at the Australian National University. She has recently submitted her PhD thesis entitled "Issues in Integrated Assessment and Modelling in Catchment Management" completed at the Centre for Resource and Environmental Studies, The Australian National University.

She is currently employed as a Post-Doctoral Fellow at the Integrated Catchment Assessment and Management Centre, ANU. Her research interests lie in integrating modelling (especially hydrology and economics) for considering policy scenarios.

2. Tim Harrold
NATURAL SYSTEMS CATEGORY

Tim Harrold's PhD topic is "Stochastic generation of daily rainfall for catchment water management studies."

He has developed methods for generating long synthetic sequences of single-site daily rainfall which incorporate low-frequency features such as drought, while still accurately representing the day-to-day variations in rainfall. The resulting generated sequences provide a better representation of the variability associated with droughts and sustained wet periods than was previously possible. These sequences will be useful in catchment water management studies as a tool for exploring the

potential response of catchments to possible future rainfall.

Tim's supervisors are:
Dr. Ashish Sharma, School of Civil and Environmental Engineering
Prof. Simon Sheather, Australian Graduate School of Management.
Dr. Dugald Black (industry co-supervisor), New South Wales Department of Land and Water Conservation.

3. Felix Chan
SOCIOECONOMIC SYSTEMS CATEGORY

Felix obtained his undergraduate degree from the University of Western Australia in 1996. His Honours Topic was titled "Symmetries of Partial Differential Equations". The title of Felix's PhD dissertation is "Modelling Smooth Transition Financial Volatility" and his supervisor is Professor Michael McAleer from the University of Western Australia. In addition to presenting his work at several MODSIM conferences, he will present his latest work at the *International Conference on Environmental Modelling and Software*, Lugano, Switzerland in mid 2002,

RECIPIENTS OF STUDENT COMMENDATION LETTERS

Apart from the foregoing three student winners who have received cash prizes and commendation letters, the following students have received commendation letters for their excellent presentations:

Gavin Bowen: General Systems

Suhejla Hoti: Socio-Economic Systems

Gavin is from Adelaide University and Suhejla is from the University of Western Australia.

EARLY CAREER RESEARCH EXCELLENCE (ECRE) AWARDS 2002

1. Jan Herbert
NATURAL SYSTEMS CATEGORY

Jan Herbert lives on the Central Coast of New South Wales in a picturesque beach setting. Her most recent permanent academic position was as a Senior Lecturer in Information Systems at the University of Western Sydney. Since leaving UWS Jan has been teaching on a casual basis at Avondale College and Newcastle University - Ourimbah and working as a computing consultant to small business. Her research interests have been in the area of environmental modeling. In particular, modeling temperature distributions in and around urban canyons. Jan is interested in the environment, and, living in such a pristine environment, is now considering a change of this existing modeling focus from the built environment to the natural environment.

2. David Mayer
NATURAL SYSTEMS CATEGORY

Graduating with a B.Sc. (Environmental Studies) from Griffith University in 1978, David commenced working as an actuary with National Mutual. Two years later he joined the Queensland Department of Primary Industries as a biometrician, and has worked for them since. Initially in head office, he saw field experience whilst based in Rockhampton, and is currently at the Animal Research Institute, Yeerongpilly. He has co-authored 51 journal papers, as well as 60 conference and other publications. In 2000 he completed a Ph.D. (Maths Department, University of Queensland) on the application of genetic algorithms to agricultural systems, and then adapted this thesis into a book (2002; Kluwer Academic Publishers). He has conducted two overseas consultancies (to Thailand), and has modelled dairying, beef, horticultural, epidemiology, fisheries and marketing systems. He was the project leader of the award-winning 'Bio-economic model of the screwworm fly' project, which was federally funded. He is currently leader of DPI's 'Macadamia crop forecasting' and 'Systems overview of the northern Australian beef industry for optimal management of resources' projects, the latter in collaboration with researchers at the Queensland Centre for Climatic Applications, and the Beef Quality CRC at Armidale.

3. Romy Greiner
SOCIO-ECONOMIC SYSTEMS

Romy has been employed as an ecological economist with CSIRO Sustainable Ecosystems since 1997. She was initially based in Canberra before shifting to Townsville three years ago. The emphasis of her analytical work lies in designing regional-scale dynamic systems models that explore the relationships of nature-based industries, including agriculture and tourism, and their development with the community

and the environment. This work is undertaken in liaison with industry, community and government clients and underpins policy design and choices about future development. Romy completed a doctorate in Agricultural Sciences at the University of Hohenheim in Stuttgart, Germany, in 1991. As part of her PhD, she developed a modelling framework to anticipate how policies proposed under the European Community framework would influence agricultural activities in a region with respect to the trade-off relationship between industry profitability and environmental sustainability. Romy came to Australia in 1992. She received a post-doctoral research fellowship from the Alexander von Humboldt-Foundation and worked at the University of New England in Armidale, NSW for 3 years. She developed a dynamic model to explore the options and potential futures of farms located in the salinisation zone of the Liverpool Plains catchment. She progressed this work to a catchment-scale analysis during her time at the Australian Bureau of Agricultural and Resource Economics in 1995/6 and continues to maintain a strong interest in salinity and water management issues.

4. *Chritine Lim*
SOCIOECONOMIC SYSTEMS CATEGORY

Dr Christine Lim obtained her PhD from the University of Western Australia. She has a Master of Economics From the University of Western Australia and currently holds the position of Senior Lecturer at the Griffith University. Her research interests are in applied econometrics, tourism modelling and tourism management. She also lectures in the area of tourism planning and development and tourism management. Christine is also a member of the International Association for Mathematics and Computers in Simulation and the Asia Pacific Tourism Association. Christine has contributed to a number of professional organisations.

6. *Andrea Rizzoli*
GENERAL SYSTEMS CATEGORY

Andrea obtained his PhD in Control Engineering and Computer Science in Milan, Italy. He also has an undergraduate degree in Electronic Engineering, also from Italy. He has spent time as a researcher at the DSIA Lugano as a senior research scientist. His main research activities and interests are in optimisation and simulation of natural resources systems and model integration he has also worked as a Research Scientist at the Division of Water Resources of CSIRO Australia, where he took part in the design of WinCMSS, software for the management of the nutrient balance in small catchments and also

designed a prototype of an environment for the integration of environmental models. As a visiting Research Fellow at the "Institut de Zoologie et d'Ecologie Animale Universite' de Lausanne, he developed the software tool "LakeMaker" for modelling and simulation of the eutrophication process in deep lakes. Andrea has developed a web-based Conference Management Tool which will be used for MODSIM 2003.

4. *Robert Argent*
GENERAL SYSTEMS CATEGORY
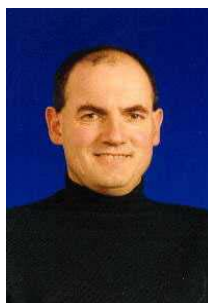
Dr Argent is a Senior Research Fellow at The University of Melbourne. He completed a BE at Melbourne in 1985 and worked for two years with the NZ Agricultural Engineering Institute rural structures group.

Rob undertook an MESc in Canada in wind engineering, and followed this with a PhD in environmental engineering at The University of Melbourne. Since 1995 he has undertaken research on land and water resources, and recently completed a 5 year project, developing processes and tools for integration of research information into catchment management.

He leads the CRC for Catchment Hydrology project "Development of a Catchment Modelling Toolkit".

FELLOWS
2001

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1. *Sylvia Esterby*
NATURAL SYSTEMS CATEGORY

Dr Sylvia Esterby received her Bachelor's degree from Queens and her Ph.D. from the University of Waterloo. After brief positions at Waterloo and Agriculture Canada, she joined what is now the National Water Research Institute, a branch of Environment Canada, where she held the position of Research Scientist until recently. She has also taught at McMaster University. She is now at Okanagan University College in the Department of Mathematics and Statistics. Dr Esterby's work has been primarily in the area of environmental applications and she has been active in promoting environmetrics. Currently, she is President of the International Environmetrics Society.

2 Professor Les Oxley
SOCIOECONOMIC SYSTEMS CATEGORY

Les Oxley graduated in Economics with Honours at the University of Wales, Swansea, MA (Money and Finance), University of Sheffield and PhD, Tilburg University. He is currently Professor of Economics, University of Waikato New Zealand, a post he has held since 1996. Prior to this he was Lecturer and then Senior Lecturer in Economics at the University of Edinburgh. In addition he has been a Visiting Scholar at Uppsala University, Sweden (1984), Visiting Fellow, Research School of Social Sciences, Australian National University (1987) and Visiting Senior Lecturer, Monash University (1988, 1989) and University of Western Australia (1992, 1994, 1995).

Professor Oxley was founding and remains editor of the Blackwells journal, Journal of Economic Survey. In addition he has co-edited three books and a large number of refereed journal articles in economics, applied econometrics and latterly clinometrics. In particular, he has published in a wide range of journals including Oxford Bulletin of Economics and Statistics, Economics Letters, Journal of Applied Statistics, Scottish Journal of Political Economy, European Journal of Political Economy, Economic Modelling, Applied Economics, Applied Economics Letters, Economic History Review, Journal of Economic History, Explorations in Economics History, Journal of the Royal Statistical Society (Series C), Economic Record, New Zealand Economic Papers, Australian Economic History Review, Manchester School, Bulletin of Economic Research, Journal of Economic Studies, Industrial and Corporate Change, International Review of Applied Economics, Review of Income and Wealth, Mathematics and Computers in Simulation and Envirometrics.

Les has a strong interest in collaborative work and is especially helpful in encouraging young researchers and other colleagues to publish their research work.

In 1999 Les was Convenor of the highly successful MODSIM99 conference held in Hamilton, New Zealand. This was the first time the Meetings had been held in New Zealand and Les was very active in bringing them across the Tasman. He has reviewed several previous MODSIM meetings including MODSIM93 held in Perth (see Journal of Economic Surveys, 8, 197-201, 1994), MODSIM95 held in Newcastle, NSW (see Journal of Economic Surveys, 10, 225-231, 1996) and MODSIM97 held in Tasmania (see Journal of Economic Surveys, 12, 399-415, 1998) so had an idea of the expectations of the Society. He was also very cognizant of Michael McAleer's "The Ten Commandments for Organizing a Conference", also published in the Journal of Economic Surveys, volume 11, pp. 231-233, 1997.

3. Professor Toshop Nakanishi
GENERAL SYSTEMS CATEGORY

Toshio Nakanishi was born in in Mie Prefecture, Japan. He graduated from Tokyo University in 1956. He completed a Doctor of Eng. (Tokyo University) in 1958 He is currently the Vice President of Personal Computer Users' Application Technology Association, Councillor of the Japan Society for Simulation Technology, Committee Member of the Council for Official Document Disclosure and Personal Information Protection, Nerima Ward Nakayama Hayao Foundation for Science, Technology and Culture, Research Subsidy Selection Committee Member, and Associate Vice President of SCSI (The Society for Computer Simulation International), Pacific Rim Council (SCSI) Steering Committee Member Vice President of China-Japan Micro Computer Application, College Chairman of the Special Survey Committee of Virtual Simulation System. His recent books include: Systems Simulation, Systems Simulator Computer Simulation, An Introduction to Computer Simulation

NEW WEB SITE

MSSANZ has developed a new web site, accessible at: http://mssanz.cres.anu.edu.au

Features include a description of the Society, in particular its aims and affiliated societies, details on conferences, conference proceedings and the Newsletter, and a listing of Fellows, Medallists, Student Prize winners and Early Career Research Excellence Awards. There are also hyperlinks to a page advertising upcoming conferences, and another to the membership application, updating and fee payment form. At present, this has to be printed off and mailed to our Secretary, Susan Cuddy, but it has been designed so that it can be readily modified in the near future to handle on-line applications and subscription payments. Another future development will be on-line access to the Society's past Newsletters.

Web pages are continually being updated to provide information on the Society's next biennial conference (MODSIM 2003) to be held in Townsville, 14-17 July, 2003. The web page address is: http://mssanz.cres.anu.edu.au/modsim2003.html

We encourage members to make use of the Society's new web site, and to feel free to email suggestions for its future development to dwhite@acslink.aone.net.au

David White
Communications Officer

MSSANZ MEMBERSHIP

Membership fee for MSSANZ is AUS$22 (including 10% GST) for two years. Members receive a AUS$70 reduction in their registration fee at the next Biennial Conference and do not pay a membership fee for the next two years.

CALL FOR NOMINATIONS FOR 2003 BIENNIAL FELLOWS

Nominations are required by July 31, 2002 for the Biennial Fellows of the Modelling and Simulation Society of Australia and New Zealand Inc. in three categories (see below). They will be presented at the MODSIM 2003 Congress in Townsville. Any person who has been a member of MSSANZ Inc. since December 1998 may be nominated.

Nomination should be made by another member of the Society, who is required to make the case in writing to the President. Nominations should stipulate the category. **Category 1 is Natural Systems, Category 2 is Socioeconomic Systems and Category 3 is General Systems.**

Criteria for Awards

There shall be two essential criteria for the Award of Medals. They shall be: unselfish dedication to promoting the aims of the Society, and outstanding contributions to modelling and simulation over a sustained period, with particular emphasis on the previous 4 years. Selection panels will normally comprise the President plus two other Society members.

Presentation

The Society's Fellow awards for 2003 will be presented at the biennial conference in Canberra (MODSIM 2003).

INTERNATIONAL ENVIRONMENTAL MODELLING AND SOFTWARE SOCIETY

The iEMSs (pronounced eye-EMZ) is staging its first Biennial Meeting in Lugano from June 24-27, 2002. Its aims are similar to MSSANZ Inc. and its conference will be conbened in 'even' years, as opposed to MSSANZ's 'odd' years. It is linked to the Elsevier journal, Environmental Modelling and Software
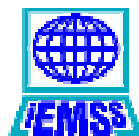
 See www.iemss.org for details.

MANAGEMENT COMMITTEE OF MSSANZ Inc.

President: *Anthony Jakeman*
Centre for Resource and Environmental Studies
The Australian National University
CANBERRA ACT 0200
Telephone: +61 (02) 6249 4742 - Fax: +61 (02) 6249 0757
Email: tony@cres.anu.edu.au

Vice-President*: Michael McAleer*
Email: mmcaleer@ecel.uwa.edu.au

Secretary: *Susan Cuddy*
CSIRO Land and Water
GPO Box 1666
CANBERRA ACT 0200
Telephone: +61 (02) 6246 5705
Fax: +61 (02) 6246 5845
Email: Susan.Cuddy@csiro.au

Treasurer: Juliet Gilmour*:* jgilmour@cres.anu.edu.au

Administrator: Susan Kelo: susank@cres.anu.edu.au

Public officer: Robert Argent: R.Argent@unimelb.edu.au

Communications officer: *David White***:**
Fax: +61 (02) 6255 2455
Email: dwhite@acslink.aone.net.au
http://www.acslink.aone.net.au/asit

Committee members:
Vince Bidwell:	bidwell@kea.lincoln.ac.nz
Peter Brooker:	pbrooker@geology.adelaide.edu.au
Christine Lim:	Christine.kim@mailbox.gu.edu.au
David Post:	David.Post@csiro.au
Les Oxley :	l.oxley@econ.canterbury.ac.nz
David White:	dwhite@acslink.aone.net.au
Andrew Zerger:	a.zerger@unimelb.edu.au

Proceedings of the International Congress on Modelling and Simulation, (MODSIM 2001), 10-13 6-9 December, 2001, The Australian National University, Canberra, Australia, Edited by: Fereidoun Ghassemi, et al.

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Ms Susan Kelo, The Australian National University
C/- CRES, Building 43
The Australian National University
CANBERRA ACT 0200 AUSTRALIA
Fax: +61 (2) 6125 8395
Email: susank@cres.anu.edu