

**The Sixteenth Triennial Conference of the
International Federation of Operational Research Societies**

Conference theme:

**OR in a globalised,
networked world economy**

FINAL PROGRAMME

8-12 July 2002

University of Edinburgh

in the centre of Edinburgh

Capital of Scotland

Hosted by the UK Operational Research Society

WELCOME MESSAGE FROM IFORS PRESIDENT



You are warmly and sincerely welcomed to IFORS 2002, the Sixteenth Triennial Conference of the International Federation of the Operational Research Societies, that will be held in Edinburgh, capital of Scotland, from July 8 to July 12, 2002. The conference is hosted by the UK Operational Research Society.

Operational Research as a scientific and professional field has been adapting itself to an evolving world since it was born more than sixty years ago. Because of its intrinsic interdisciplinary nature, ability to tackle real world situations and capacity to support complex decision making processes, OR can provide effective tools for modelling and solving these issues. Indeed, operational researchers can propose structural models of the problem, techniques for the analysis of alternative solutions and methods of validation, implementation and evaluation of the chosen solution. By considering the Conference Theme, i.e., *OR in a globalised, networked world economy*, it is essential that OR carries on a continuous process of updating and growth.

IFORS 2002 will be more than a standard Scientific Conference, as it will also provide many opportunities for practitioners and OR users to exchange ideas and experiences. There will be a lot of opportunities to meet old friends, to establish new contacts, to learn from others.

The Program and Organizing Committees, chaired by Ben Lev and Lyn Thomas, respectively, have arranged exceptional scientific and social activities. I am sure that you will enjoy a lot IFORS 2002. Together with our kind British hosts, I welcome you to Edinburgh.

Paolo Toth, IFORS President

WELCOME MESSAGE FROM THE PROGRAM COMMITTEE CHAIR



On behalf of the IFORS 2002 Program Committee, welcome to *The Sixteenth Triennial Conference of the International Federation of Operational Research Societies*. The Program committee worked for four years to organize the best possible intellectually stimulating meeting. It is an opportunity to renew old friendships and make new friends, exchange ideas and enhance knowledge.

This is a milestone for IFORS as we close the first Fifty Years of Conferences and start the first conference in the new millennium. The theme of the conference, *OR in a globalised, networked world economy*, suggested by Costas P. Pappis and approved by the program committee, reflects the role of the various OR disciplines in the world economy.

The Program Committee consists of a diverse group – 25 members from 19 countries and all five continents. This is the first IFORS conference planned and prepared in Cyber Space. All our business, including abstract submission and communication with authors, was conducted via the web, email and electronic media.

We have an exciting program! Three keynote speakers from three different continents, 44 Streams, 375 sessions, 1,067 papers, and 1,806 authors from 63 countries. This is the largest IFORS meeting ever, with the largest number of papers, authors, and delegates. A CD with the program and name list is distributed for your future reference.

On behalf of the Program Committee, I want to offer our thanks to our colleagues and supporting academic institutions: University of Michigan – Dearborn; University of Edinburgh; and the British OR Society. To the stream chairs, session chairs, speakers and all who made this meeting possible, and those of you who attend the conference – without you it would have been impossible.

We extend our warmest welcome and trust that you will enjoy this memorable and exiting meeting.
Have fun in Edinburgh!

Ben Lev, Program Committee Chair

WELCOME MESSAGE FROM THE ORGANISING COMMITTEE CHAIR



On behalf of the Organising Committee of IFORS 2002, let me welcome you to Edinburgh, the capital of Scotland. The Operational Research Society of the UK was delighted to host the first such international conference in Oxford in 1957 and is similarly delighted to host this, the first conference of the new millennium. Edinburgh has a long tradition of scientific discoveries – Napier, the inventor of logarithms, lived here, and Hutton’s question about the strata of Salisbury Crags in Holyrood Park was the birth of geology. It also is renowned for its intellectual curiosity and the names of the buildings housing this conference honour the leaders of the Enlightenment and a Nobel Prize winner. We hope this conference will also involve a successful mix of discovery and curiosity. The Scottish people too are very welcoming and proud to show visitors their capital city and the countryside around. It is not surprising that it was Robbie Burns, the most celebrated Scottish poet, who wrote “Auld Lang Syne,” the hymn to long lasting friendship. We are sure you will find such friendship and much to enjoy in Edinburgh, both within and outside the conference.

Lyn Thomas, Organising Committee Chair

IFORS EXECUTIVE COMMITTEE

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Bob Miles, UK
John Quigley, UK
Maurice Shutler, UK

Conference Secretariat Chris Barrett, UK

Programme At A Glance

Sunday, July 7, 2002	Registration Euro Executive Meeting IFORS General Meeting Welcome Reception in Teviot Row House	2:00 – 6:45 6:00 – 8:00
Monday, July 8, 2002	MA (Parallel Sessions) Coffee Break MO (Opening Session) MP (Plenary Session) Lunch MC (Parallel Sessions) Coffee Break MD (Parallel Sessions) Bar quiz at The Blind Poet Public House	9:30 – 11:00 11:00 – 11:30 11:30 – 12:00 12:00 – 1:00 1:00 – 2:00 2:00 – 3:30 3:30 – 4:00 4:00 – 5:30 8:30
Tuesday, July 9, 2002	TA (Parallel Sessions) Coffee Break TB (Parallel Sessions) Lunch TC (Parallel Sessions) Coffee Break TD (Parallel Sessions) Scottish Dancing with a Ceilidh band at Teviot Row House, George Square and Neeps, Tatties and Haggis	9:00 – 10:30 10:30 – 11:00 11:00 – 12:30 12:30 – 1:30 1:30 – 3:00 3:00 – 3:30 3:30 – 5:00 8:30 9:30
Wednesday, July 10, 2002	Choice of: leave Appleton Tower Glenturret Distillery - Stirling - Stirling Castle Blair Atholl Distillery - Blair Castle - House of Bruar Falkland Palace - St Andrews - Glamis Castle Lindisfarne - Berwick upon Tweed, or Spittle Beach - Lohcarron Scottish Cashmere Wool Centre	9:00 returning between 6:00 – 6:30
Thursday, July 11, 2002	RA (Parallel Sessions) Coffee Break RB (Parallel Sessions) Lunch RC (Parallel Sessions and OR Society President's Medal) Coffee Break RD (Parallel Sessions) Conference Banquet at Murrayfield, home of Scottish Rugby buses leave from Jury's Inn, George Square and Pollock Halls	9:00 – 10:30 10:30 – 11:00 11:00 – 12:30 12:30 – 1:30 1:30 – 3:00 3:00 – 3:30 3:30 – 5:00 7:00
Friday, July 12, 2002	FA (Parallel Sessions) Coffee Break FB (Parallel Sessions) Lunch FP (Plenary Sessions) FD (Parallel Sessions)	9:00 – 10:30 10:30 – 11:00 11:00 – 12:30 12:30 – 1:30 1:30 – 2:30 2:40 – 4:10

General Information

Location and Registration

The conference registration desks, located in the foyer of the Appleton Tower, Edinburgh University, Crichton Street, Edinburgh will be open during the following times each day to provide information and general assistance to all delegates.

Sunday 7 July	14:00 – 18:45
Monday 8 July	08:00 - 17:30
Tuesday 9 July	08:30 - 17:30
Thursday 11 July	08:30 - 17:30
Friday 12 July	08:30 - 16:00

On registering you will have received a conference bag and materials, including a conference badge, which must be worn to conference events. Registered accompanying persons will also been issued with a badge together with tickets for admission to the entire social programme.

All Tickets, which will have to be shown for the Wednesday excursions and the conference banquet, will be provided at registration.

Accompanying persons

Accompanying persons are invited to all the events of the above Social Programme. For further information or private excursions, contact the Edinburgh Tourist Office near Waverley Station, Tel: 0131 473 3666

Information Desks

Information about *all aspects* of the Conference can be obtained from staff at the Information Desk in the foyer of the Appleton Tower. Clansman Monarch will be present in the Appleton Tower to handle accommodation queries on Sunday, 7 July 14:00 – 18:00 and Monday, 8 July 08:00 – 16:00. Clansman Monarch will also man a ‘swap shop’ for the social excursions, if required, on Monday 13:00 – 16:00 and Tuesday 08:30 – 13:30.

Messages for Conference Participants and Exhibitors

To receive messages by 'phone and fax please ask your correspondent to use the conference office telephone and fax numbers Tel/Fax: 0131 650 4581. All messages will be posted on a message board located in the Foyer of the Appleton Tower. Please note that neither participants nor exhibitors can be contacted by telephone directly. All faxes must clearly display IFORS2002 and the name of the intended recipient.

Participants wishing to exchange personal messages during IFORS2002 should use the message board in the Appleton Tower.

E-Mail Service

E-mail access is available in the Open Access Computing Lab, Level 5 of the Appleton Tower. during the following times:

Monday 8 July	08:30 - 17:00
Tuesday 9 July	08:30 - 17:00
Thursday 11 July	08:30 - 17:00
Friday 12 July	08:30 - 15:00

Lecture Rooms

Opening Plenary	Festival Theatre
Presidents Medal	George Square Lecture Theatre
Final Plenary	George Square Lecture Theatre
Session Rooms	Appleton Tower (AP) William Robertson Building (WR) David Hume Tower (DH) Management School (MS)

Photocopying and Fax Facilities

Should you wish to send a fax or make a photocopy please contact the registration staff who will be delighted to assist you. Small charges will be made for this service as follows:

Photocopying	10p per sheet
Fax - National	50p per sheet
Fax - International	£1.00 per sheet

Programme Changes

An updated daily programme will be available at each of the main Conference buildings and on the Internet.

Notice to Speakers and Chairpersons

All lecture rooms have an overhead projector, data projector and screen. Presenters are expected to bring their own laptop computer, there are **NO** laptops available for presenters on site. The rooms will be kept open for 30 minutes after the final session of each day, and will be available from 09:00 – 09:30 Monday morning, for presenters to check compatibility of their computers with data projectors.

Refreshments and Lunches

Tea/Coffee Breaks

Complimentary tea and coffee will be available during the morning and afternoon breaks at the following venues.

- Appleton Tower Concourse
- David Hume Tower Foyer
- Management School Foyer
- William Robertson Building Foyer

Lunch

Lunch and snacks can be purchased in various rooms in the Teviot Row House from 12:00 – 14:00. There are also two licensed bars.

In addition to these there are a number of restaurants, cafes and pubs within a short walk of the conference venue.

Church Service

A feature of the UK conferences for many years has been a short service of Christian worship. This year, we are all invited to join the regular service at historic Greyfriars Presbyterian Kirk on Thursday from 1.10-1.30pm. Greyfriars stands near the south end of George IV Bridge, at the junction with Candlemaker Row. The entrance to the Kirkyard is directly opposite the new Museum of Scotland. It is a very short walk from the conference site: cross the street from the McEwan Hall, and at the end of Bristo Street, the Kirk will be opposite, across the street. For information about the church see <http://www.greyfriarskirk.com/>

Social Programme

Sunday 7 July - Welcome Reception, Teviot Row House conference site 18:00 – 20:00. All delegates registered accompanying persons and exhibitors are invited to attend. Wine and soft drinks will be served, giving persons the opportunity to meet colleagues in a convivial atmosphere.

Monday 8 July – Bar Quiz at the Blind Poet Pub, 34 West Nicolson Street from 20:30, see “BP” on the location map.

Tuesday 9 July – Exhibitors will hold a reception from 19:30 – 20:30, entrance by ticket only, at Teviot Row House, conference site.

Scottish Evening, which is open to all delegates, Teviot Row House 20:30. An evening of Scottish Entertainment awaits combining traditional Scottish food and wine with Scottish folk music and ceilidh dancing. During the evening delegates will have the opportunity to sample Scotland’s favourite dish – haggis, neaps and tatties – followed by a chance to participate in traditional Scottish country dancing.

Wednesday 10 July – Conference excursions:

Coaches for all excursions leave from outside the Appleton Tower at 09:00 returning at 18:00.

Glenturret Distillery – Stirling – Stirling Castle

This outing combines a VIP guided tour and whisky tasting at Glenturret Distillery, Scotland’s oldest Highland malt distillery situated on the outskirts of the market town of Crieff, with a visit to **Stirling Castle** – one of Scotland’s finest and most impressive castles. Different coaches will visit the attractions in different sequence. The day will allow 1 ½ hours free time in **Stirling**, enabling guests to wander through the cobbled streets of this historic town and eat their packed lunch. The journey by coach will encompass some beautiful Perthshire scenery, and also include magnificent views of the Firth of Forth when crossing the Forth Road Bridge. Participants will spend around 1½ hours at Stirling Castle (guided tours will be arranged). Around 2 hours will be available at Glenturret, to take the guided tour, taste the whiskies and browse in the shop.

Blair Atholl Distillery - Blair Castle - House of Bruar

This outing will take participants northwards over the Forth Road Bridge and up to Pitlochry, gateway to the Highlands, where the coaches will head to three destinations - **Blair Atholl Distillery, Blair Castle** and the **House of Bruar**; different coaches will visit the sites in different sequences. At Blair Atholl, participants

will enjoy a guided tour of the distillery, with the chance to sample some of Scotland's 'water of life'. Blair Castle, set in extensive parklands, is the traditional home of the Dukes of Atholl and here participants will spend a total of 2 ½ hours and can enjoy a full guided tour of the Castle, with time to eat their packed lunches in the grounds. A few minutes north of Blair Castle is the House of Bruar, an exclusive and attractive shop selling the best of Scottish clothing, food and sporting equipment.

Falkland Palace - St Andrews - Glamis Castle

This outing will take persons northwards over the Forth Road Bridge to **Falkland Palace**, one of the National Trust for Scotland's flagship properties. After 1 ¼ hours there participants will continue to **St Andrews**, Scotland's home of golf, where they will have 1 ¾ hours to explore this historic university town and eat their packed lunch. **Glamis Castle**, childhood home of the late Queen Mother, will be another destination, and participants will enjoy a guided tour of the Castle and time to wander in the grounds, spending 1½ hours at their leisure. Different coaches will visit the sites in different orders.

Lindisfarne - Berwick upon Tweed, or Spittle Beach - Lochcarron Scottish Cashmere Wool Centre

This outing combines a guided tour of the Lindisfarne Heritage centre with time to explore the rest of Holy Island. The journey by coach will take the East Coast tourist route through magnificent coastal scenery to the Borders. Participants will then travel across country through stunning lands steeped in the history of hundreds of years of conflict and reconciliation to “Lochcarron of Scotland”, Scottish Cashmere Wool Centre where they will spend 1 ½ hours and have the opportunity to buy products in their shop plus a guided tour of the Mill. In addition coaches will visit Berwick or Spittle for 1 hour depending on the weather. The packed lunch can be eaten at either of these tours.

Thursday 11 July – Conference banquet at Murrayfield stadium, home of Scottish Rugby. Coaches will leave at 19:00 from 3 pick up points: Jury's Inn - Jeffery Street; the Appleton Tower and Pollock Halls, on the road outside the main entrance. A reception will be held, weather permitting, on the trackside prior to the dinner, which begins at 20:00. Coaches will return from 22:30 onwards.

International Transactions in Operational Research (ITOR)

All paid registrants, except Student Registrants and Accompanying Person Registrants, will receive free access to the electronic version of ITORE for a three-year period from January 1st, 2003. Details will be sent via the email address you have supplied. However, you will not receive this if:

(a) You have not supplied an email address when you registered (in which case you will receive the printed version of Vol. 10, 2003, sent to the address given on your registration form), or

(b) You inform the publishers (Mr Brant Emery, Senior Marketing Controller, Blackwell Publishing Ltd, 108 Cowley Rd, Oxford, OX4 1JF, UK Direct Tel: +44 (0) 1865 382265, Direct Fax: +44 (0) 1865 381265, bemery@blackwellpublishers.co.uk) that you wish to receive the printed version of volume 10 instead.

If you have not supplied an email address and wish to receive electronic access please inform Mr. Emery at the earliest opportunity.

Sponsor Information

IFORS 2002 is extremely grateful to the following sponsors:

Centre for Mathematical Modelling and Flow Analysis (CMMFA)

<http://cmmfa.mmu.ac.uk/> - Part sponsor of the conference bag.

The Centre for Mathematical Modelling and Flow Analysis (CMMFA) is based in the Department of Computing and Mathematics of Manchester Metropolitan University. Our current activities include two projects studying the effects of wave impact on Sea Walls. Global warming is increasing wave heights around the UK coastline, placing a large amount of coastal infrastructure and sea defences at risk.

With partners from six other EU countries we are currently developing risk assessment tools, based on neural networks, for permissible wave overtopping performances of sea walls.

Our expertise - modelling multi-dimensional transient processes.

Defence Science and Technology Laboratory (Dstl)

Part sponsor of the Final Programme

The Defence Science and Technology Laboratory (Dstl) is the centre of scientific excellence for the UK Ministry of Defence. It delivers defence research of the highest calibre, specialist technical services and an ability to track global technological developments. Its analysis capabilities constitute the largest operational research group in Europe and support the UK Government and Armed Forces across a wide spectrum of defence and security issues, from policy formulation to the planning of current operations.

The GROUPEM Network: A Community for Collaborative Simulation Modelling.

Part sponsor of the Conference bag

The GROUPOSIM Network (www.groupsims.com) is a community of academics, industrialists, and vendors who are interested in the emerging field of *Collaborative Simulation Modelling* (CSM). CSM is a term used to refer collectively to new social processes, tools and infrastructure in modelling and simulation offered by new technology support of human-to-human and computer-to-computer collaboration. The focus is on process-based simulation modelling practised in business, manufacturing, and service industries as well as some areas of defence. It includes, but is not limited to, applications of distributed computing such as

- CSCW/groupware
- distributed simulation
- parallel simulation
- web-based simulation

The main mission of the GROUPOSIM Network is to create the foundation for the proliferation of integrated collaborative simulation modelling techniques, tools and infrastructure in the larger academic and industrial communities by promoting a discursive forum to promote skills transfer between researchers, vendors, and end users. The two main guiding lights of this work are *evolution not revolution* and *dissemination by demonstration*.

If you are interested in this work, or wish to join the mailing list, then contact the co-ordinator of the GROUPOSIM Network (Dr Simon J E Taylor) through the web site or by email simon.taylor@brunel.ac.uk. The GROUPOSIM Network is partially supported by EPSRC grant GR/N35304 and is hosted by Brunel University.

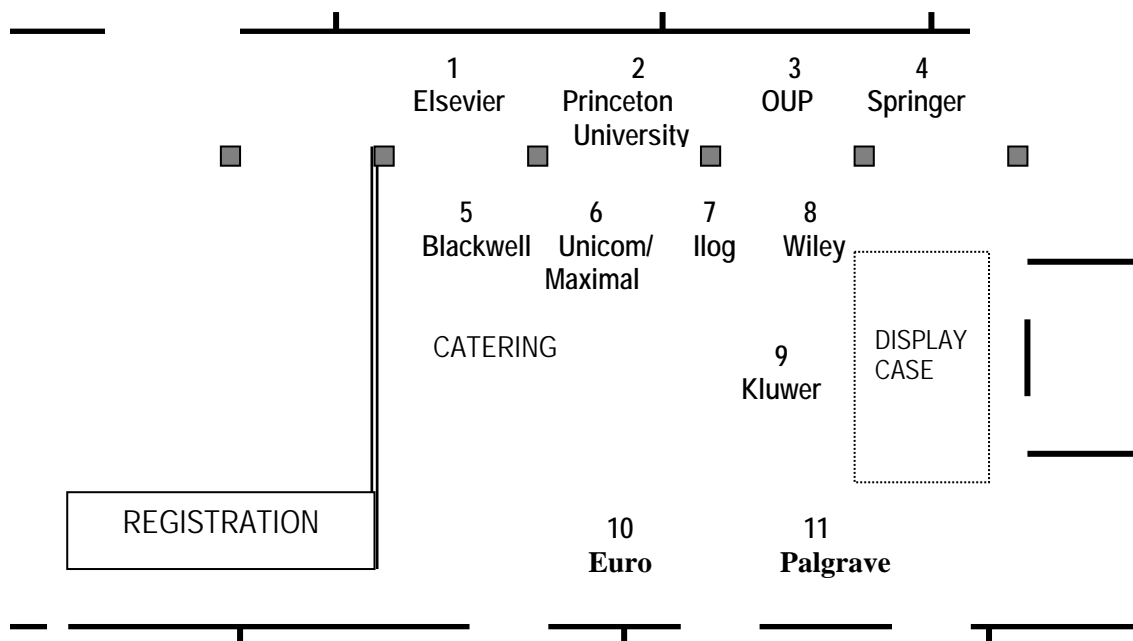
Exhibition Information

IFORS2002 would like to thank the undernoted companies for supporting the Conference Exhibition. We asked each company to describe the services they provide in their own words [IFORS does not endorse any particular product] Exhibitors have described their companies in their own words. We invite you to visit each of their stands during the Conference. All exhibition stands are located in the Appleton Tower Concourse. The opening hours of the exhibition will be as follows:

Monday 8 July	10:30 - 17:30
Tuesday 7 July	09:00 - 17:30
Thursday 10 July	09:00 - 17:30
Friday 11 July	09:00 - 16:00

Some exhibitors will be exhibiting for part of the conference only.

Exhibition Layout:



Blackwell Publishing (8 & 9 July) Stand 5

Rachel Chandler, 108 Cowley Road, Oxford OX4 1JF

Tel: 01865 382225 e-mail: RChandler@blackwellpublishers.co.uk

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Blackwell Publishing is dedicated to serving the global academic community, and we are committed to supporting the global academic community in both teaching and research.

We are proud to be publishing one of the official IFORS journals and hope that through our partnership we can make International Transactions in Operational Research a leading international journal.

Elsevier Science (8 & 9 July) Stand 1

Anita Olfers, Molenwerf 7, 1014 AG Amsterdam Tel: +31 20 4853003 e-mail: a.olfers@elsevier.nl

Elsevier Science-www.elsevier.com/locate/dsw - Decision Sciences Web offers free of charge: -Table of Contents & Abstracts;-Search facilities;-Access to online sample copies of 14 journals; -Instructions to Authors; A wealth of further journal information; -Preface to each volume and first two pages of each chapter published in the Handbook in Operations Research and Management Science. For access to complete articles please see details on our website.

EURO OFFICE Stand 10

Université Libre de Bruxelles, SMG / EURO CP210/01, Boulevard du Triomphe Campus Plaine, Bâtiment NO, niveau 3, local 2 N3 116B, B-1050 Brussels, Belgium Fax: +32 2 650 5970; office@euro-online.org; <http://www.euro-online.org/>

What is EURO?

EURO is the “Association of European Operational Research Societies” within IFORS. It is a “non profit” association. Its affairs are regulated by a Council consisting of representatives of all its members and an Executive Committee, which constitutes its board of directors. Its aim is to promote Operational Research throughout Europe.

The members of EURO are normally members of IFORS and comprise the national OR societies of countries located within or nearby (in broad sense) Europe. Each member is represented in the EURO Council by two representatives.

E-mail: office@euro-online.org URL: <http://www.euro-online.org>

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Kluwer Academic Publishers B.V. Stand 9

Sylvia Kors (Exhibits Manager), P O Box 989, 3300 AZ Dordrecht, The Netherlands

Tel: +31 (0) 78 65 76 124 E-mail: Sylvia.Kors@wkap.nl

Maximal Software (11 & 12 July) Stand 6

Bjarni Kristjansson, 97 Oxford Road, Uxbridge, Middlesex UB8 1LU

Tel: 01895 819 344 e-mail: info@maximalsoftware.co.uk

Maximal Software is the developer of the MPL Modeling System, a complete graphical model development environment for building mathematical optimization models. Maximal also offers the OptiMax 2000 Component Library (API) that can be used seamlessly to call MPL, from both Visual Basic and C/C++, allowing the model developer to create customized end-user applications that solve real-world optimization problems. Maximal Software has many years of practical experience and expertise in providing innovative solutions for our customers and assisting them in achieving the successful completion of their optimization projects.

Oxford University Press (8 & 9 July) Stand 3

Chris Hall, Academic Division, Great Clarendon Street, Oxford OX2 6DP

Tel: 01865 267 769; Fax: 01865 267 568; e-mail hallc@oup.co.uk

Oxford University Press is widely recognised as one of the world's premier journal publishers, combining traditional values of quality and service with the innovative use of technology. OUP publishes the journals of the Institute of Mathematics and its Applications including the *IMA Journal of Management Mathematics*. This quarterly, peer reviewed journal, publishes papers in selected areas of OR and management science including financial modelling, risk analysis, model building and optimisation, production processes, logistics, supply chain management and decision making tools. A free online trial subscription to this journal is available to IFORS delegates (see the insert in your delegate pack for details).

Palgrave Macmillan Stand 11

David Bull, Director of Journals, Houndmills, Basingstoke RG21 6XS

Tel: +44 (0)1256 302999; Fax: + 44 (0)1256 320109; email: d.bull@palgrave.com

www.palgrave-journals.com

Palgrave Macmillan is a global academic publisher serving learning and scholarship in the field of higher education, and publishing for the related professional business, management and OR markets.

We are proud to be the publishers of the *Journal of the Operational Research Society* and *European Journal of Information Systems* on behalf of The OR Society and *International Abstracts in Operations Research/IAOR Online* on behalf of IFORS.

You can browse a selection of our publications – books, journals, reference and electronic works - during IFORS 2002, or visit us at www.palgrave.com.

Princeton University Press (8 & 9 July) Stand 2

David Ireland, 3 Market Place, Woodstock, Oxon OX20 1SY

Tel: +44 (0) 1993 814502; e-mail: direland@pupress.co.uk

Please visit the Princeton University Press exhibition stand, to see our range of quality books, all offered at discount prices. Our editor David Ireland would be happy to meet you and tell you about the PUP book programme, our expansion in the sciences and our new European office. If you have plans for writing a book, David would be delighted to discuss this with you.

Springer-Verlag GmbH & Co. KG Stand 4

Dr. Werner A Mueller, Publishing Director Economics and Management Science

Tiergartenstrasse 17, 69121 Heidelberg, Germany W.A.Mueller@Springer.de

A Short Look at the Scientific Publisher Springer

Springer-Verlag is one of the most prestigious international scientific publishers today. Wherever scientific research is carried out, highly qualified experts count themselves among Springer's authors, among them a large number of Nobel prize winners.

Springer publishes annually over 2,600 new books and approximately 500 journals, also available in electronic form. A total of about 19,000 books are currently available, 60 percent of them in English. Besides the German-speaking countries, the USA and Asia are the most important markets. In addition to the headquarters in Berlin and Heidelberg, the subsidiaries in New York, London, and Tokyo in particular develop international publishing Programmes.

UNICOM Seminars/Optirisk Systems (8 & 9 July) Stand 6

Marife O'Aivazian, 1 Oxford Road, Uxbridge. Middx. UB9 4DA

Tel: 01895 819 483; e-mail marife@unicom.co.uk

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The Company is dedicated to serve a client base of IT professionals, industrial researchers, academics and corporate executives by offering them information products and supporting services in Seminars, Newsletters and Industry Reports.

UNICOM Seminars' sister company OPTIRISK SYSTEMS is a specialist provider of Optimisation and risk solutions and customised applications in diverse industry sectors including Finance, Supply Chain and Logistics, Utilities and Transportation.

UNICOM and OPTIRISK both foster a culture of research, team building and provision of excellent client focused service and training. UNICOM has Investor in People accreditation.

John Wiley Stand 8

Polly Thomas, Baffins Lane, Chichester, West Sussex PO19 1UD

Tel: 01243 770259; e-mail pthomas@wiley.co.uk

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Luggage room

Delegates leaving on Friday, 12 July may leave their luggage in the Appleton Tower Lecture theatre 4, which will be manned by a student helper.

Bank Services

The nearest bank and cash dispenser to the conference site can be found at:

The Bank of Scotland, 4 Bristol Square, Edinburgh EH8 9AL.

Opening Hours:	09:00 – 17:00	Monday to Friday.
	10:00 – 14:00	Saturday

This bank is located immediately adjacent to the Management School.

Exchange facilities can also be found at many other banks located throughout the city centre or alternatively at Waverley Train Station and airports.

Useful Telephone Numbers

Public telephones can be found throughout the campus in various locations including the Appleton Tower and Teviot Row House. Public telephones use coins, credit cards or phone cards, which are widely available in shops and post offices. Please note the following:

- To call an Edinburgh number within Edinburgh, it is not necessary to dial the code 0131
- To call a number elsewhere in the UK, you must use the area code which begins 0
- To make an international call dial 00 followed by the country code and area code
- To call the International Operator dial 155
- To call Directory Enquiries dial 192
- To call International Directory enquiries dial 153
- To call the Operator dial 100

The following numbers are for calls made within UK, if you are calling from outside the UK precede with +44 and remove the first 0.

Airports and Airlines

Edinburgh Airport	0131 333 1000
Glasgow Airport	0141 887 1111
London Gatwick	0870 0002468
London Heathrow	0870 0000123
London Luton Airport	01582 405 100
Air France	0845 084511
KLM	0870 507 4074
British Airways	0845 773 3377
British European	0870 607 0555
Delta Air Lines	0800 414 767
Easy Jet	01582 702 900

Trains

Rail Enquiries	08457 484950
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Bus Information

National Express	08705 808080
Stagecoach	0906 550 0000
Traveline (local inform.)	0131 225 3858

Taxi Cabs

City Cabs	0131 228 1211
Central Radio Taxis	0131 229 2468

Edinburgh Tourist Board

General Enquiries	0131 473 3666
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Car Hire

Avis	0131 337 6363
Arnold Clark	0131 228 4747
Hertz Rent-a-Car	0131 556 8311
EuropCar Inter-rent	0131 557 3456
Melville's	0131 337 5333

Conference Venue

Edinburgh University	0131 650 1000
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Conference phone and fax	0131 650 4581
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Contents

Monday, July 8, 2002

Session MA	1
Session MO & MP	1
Session MC	12
Session MD	24

Tuesday, July 9, 2002

Session TA	35
Session TB	47
Session TC	59
Session TD	71

Thursday, July 11, 2002

Session RA	81
Session RB	93
Session RC	104
Session RD	116

Friday, July 12, 2002

Session FA	128
Session FB	140
Session FP	151
Session FD	151

Author Index	163
---------------------	------------

Session List	181
---------------------	------------

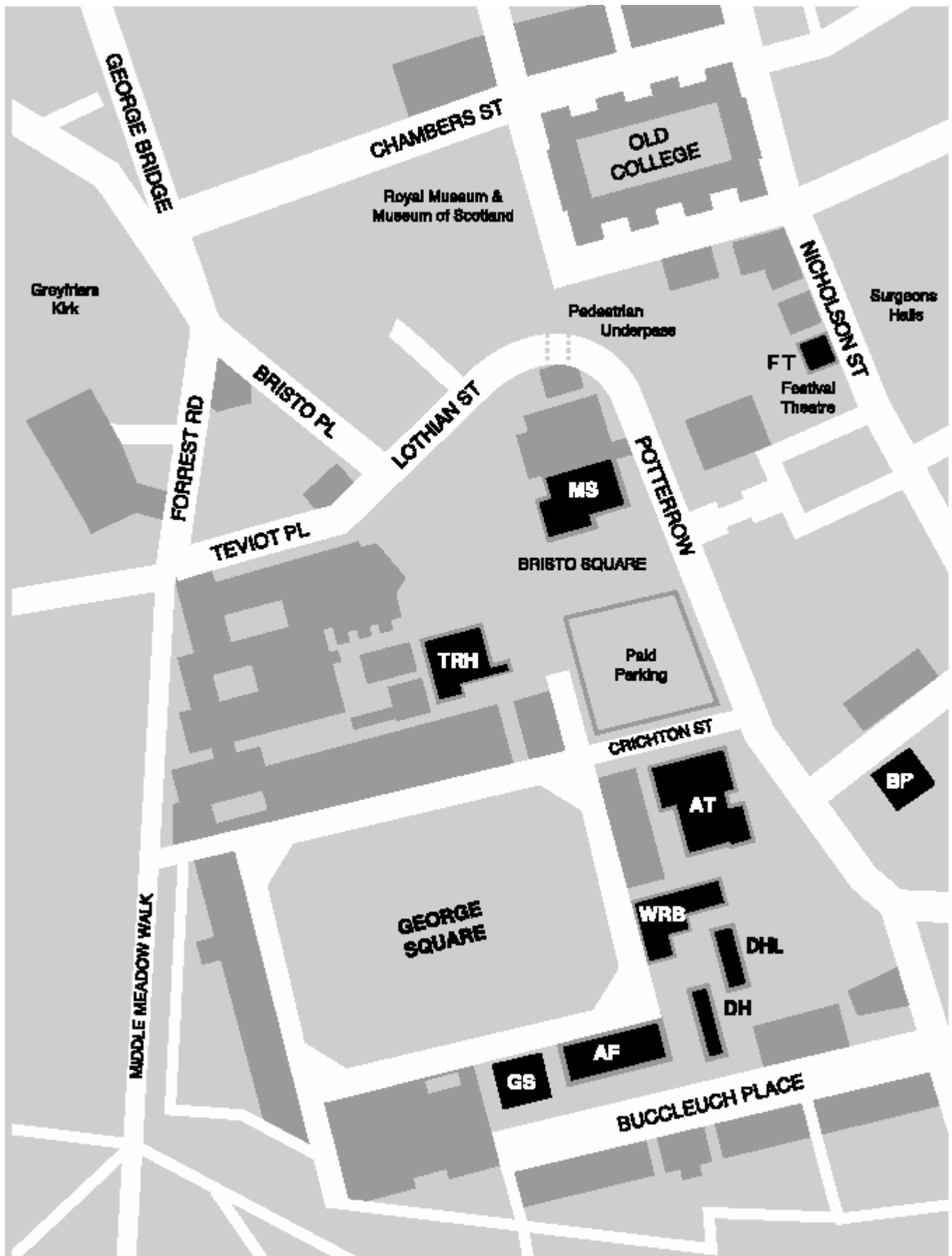
Name List	189
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Schedule	243
-----------------	------------

Rooms:

1	David Hume Tower Lecture Theatre B	DHL-B
2	David Hume Tower Lecture Theatre C	DHL-C
3	David Hume Tower Theatre Faculty Room North	DH-N
4	David Hume Tower Theatre Faculty Room South	DH-S
5	Management School Lecture 1	MS-1
6	Appleton Tower Lecture theatre 1	AT-1
7	Appleton Tower Lecture theatre 2	AT-2
8	Appleton Tower Lecture theatre 3	AT-3
9	Management School Lecture 3	MS-3
10	Management School Lecture 4	MS-4
11	Management School Lecture 5	MS-5
12	Appleton Tower, Room 6	AT-6
13	Appleton Tower, Room 7	AT-7
14	Appleton Tower, Room 8	AT-8
15	Appleton Tower, Room 2B	AT-2B
16	William Robertson Seminar room 11	WR-11
17	William Robertson Seminar room 10	WR-10
18	William Robertson Seminar room 9	WR-9
19	William Robertson Seminar room G01	WR-1
20	William Robertson Seminar room G02	WR-2
21	William Robertson Seminar room G03	WR-3
22	William Robertson Seminar room G04	WR-4
23	Adam Ferguson Seminar Room G10	AF-10
24	Adam Ferguson Seminar Room G13	AF-13
25	Adam Ferguson Seminar Room G14	AF-14
26	Adam Ferguson Seminar Room G18	AF-18
27	Adam Ferguson Seminar Room G19	AF-19
28	David Hume Tower Conference Room	DH-C
29	George Square Lecture Theatre	GS
30	Festival Theatre	FT

Site Map:



Country Distribution:

Countries	# of Authors	Countries	# of Authors
United Kingdom	320	Mexico	11
United States	289	Cyprus	7
Japan	89	Czech Republic	7
Italy	76	Croatia (Hrvatska)	6
Canada	72	New Zealand	5
Portugal	68	Singapore	5
Spain	68	Iceland	4
Brazil	66	Ireland	4
China	63	Venezuela	4
France	62	Colombia	3
Germany	55	Malaysia	3
The Netherlands	46	Yugoslavia	3
Australia	45	Congo	2
South Africa	33	Hungary	2
Belgium	32	Lebanon	2
Greece	28	Saudi Arabia	2
Korea	27	Uruguay	2
Norway	27	Zambia	2
Chile	25	Belarus	1
Taiwan	24	Kuwait	1
Denmark	22	Lithuania	1
Israel	21	Luxembourg	1
India	19	Malawi	1
Sweden	19	Morocco	1
Switzerland	19	Namibia	1
Russia	18	Northern Ireland	1
Algeria	14	Palau	1
Turkey	14	Peru	1
Finland	13	Philippines	1
Poland	13	Tunisia	1
Iran	12	United States Minor Outlying Islands	1
Austria	11		

IFORS Conferences:

Year	City	Attendance
1957	Oxford, U.K.	
1960	Aix-en-Provence, France	
1963	Oslo, Norway	
1966	Boston, USA	
1969	Venice, Italy	
1972	Dublin, Ireland	
1975	Tokyo/Kyoto, Japan	
1978	Toronto, Canada	
1981	Hamburg, Germany	
1984	Washington, D.C., USA	
1987	Buenos Aires, Argentina	
1990	Athens, Greece	
1993	Lisbon, Portugal	768
1996	Vancouver, Canada	922
1999	Beijing, China	969
2002	Edinburgh, Scotland	1,150*
2005	Hawaii, USA	

* Pre-Registration

Technical Programme

Plenary Lectures

Lecture 1: MP Monday 11:30 a.m. to 1:00 p.m.

Venue: Festival Theatre

OR Alone? Social Capital, Branding, and the OR Professional

Mike Trick

Social capital is the value we get from interactions with others. Broad social trends, particularly in the United States, point to a continuing decrease in the amount of time and effort people make in social capital activities. These trends are particularly worrisome for the OR professional due to our need to interact with others in projects, research, and teaching. To solve this problem, we must redouble our efforts to define and "brand" the OR profession.



Dr. Trick is a researcher and educator in the field of operations research, with a specialization in computational methods in optimization. After receiving his doctorate in industrial engineering from Georgia Tech, Dr. Trick embarked on two years of postdoctoral fellowships, first at the Institute for Mathematics and its Applications in Minneapolis, then at the Institut fuer Oekonometrie und Operations Research in Bonn, Germany. He then joined the faculty of the Graduate School of Industrial Administration at Carnegie Mellon University, first as an Assistant Professor of Operations Research in 1989, currently as Professor of Operations Research and President of the Carnegie Bosch Institute for Applied Studies in International Management, an institute specializing in research and education on international issues. In 1995, he was appointed the founding Editor of INFORMS Online, the electronic information service of the Institute for Operations Research and the Management Sciences, a 14,000 member professional society, and is currently the President of INFORMS. Trick is the author of twenty-five professional publications and is the editor of one volume of refereed articles. Dr. Trick has consulted extensively for such groups as the United States Postal Service, the Internal Revenue Service, Major League Baseball, the Atlantic Coast Conference college basketball league, and many other companies.

Branding OR

James Gibb

The volume of work that most of us would see as OR continues to grow rapidly. However, more and more of this masquerades under labels other than OR. This leads to fragmentation of the profession and prospective clients may fail to recognise the contribution that OR, as a coherent whole, can make. Active branding of OR would benefit for practitioners, academics and our clients.



James Gibb started in Operational Research Executive of the National Coal Board in 1966, working mainly on problems to do with coal products. He subsequently worked for 9 years as an OR consultant for the Dexion Group, where his main interest was in distribution-related OR, specifically vehicle-scheduling and depot-location problems. He continued this interest when he moved to PA Management Consultants in 1978, although he also spent a year consulting for Thames Valley Police. In 1982, he joined the Business Consultancy group at Shell in London, specialising mainly in OR problems relating to Shell's tanker fleet. After a spell as head of Information Planning, he became head of Business Consultancy from 1989-1994. For his last five years in Shell, he was involved in

Learning. Initially the focus was on IT learning, but the role later expanded to include many of the management and commercial learning needs of the Shell Group. He retired from the post of Learning Leader - Europe and Africa in 2000. He is currently senior visiting fellow in the OR department of London School of Economics. He has been active in the UK OR Society for a number of years and currently holds the post of President.

Lecture 2: FP Friday 1:30 p.m. to 2:30 p.m.

Venue: George Square Lecture Theatre

OR in for Development in a Fractured Global Order

Francisco Sagasti

Dr. Sagasti, President - FORO Nacional Internacional, Peru and Director of Agenda: PERÚ will draw on his extensive international experience in planning major development programmes. His wide research and consulting background as an OR scientist since the mid-1960s, to outline the opportunities he sees ahead for the thinking of OR scientists to increase its influence on the management of sustainable human development at international, national and local levels. He will relate this theme to the overall conference theme of OR in a Globalised, Networked World Economy.



Francisco Sagasti obtained his Industrial Engineering degree in Lima and his Ph.D. in OR and Social Systems Sciences at the University of Pennsylvania. He has been Chief of Strategic Planning at the World Bank, Visiting Professor at the Wharton School of the University of Pennsylvania, Chairman of the UN Advisory Committee on Science and Technology, and advisor to various ministers, international organizations, government agencies and private firms in Peru and in other countries. He has published more than 200 papers and 20 books on development strategies, science and technology policy; systems thinking and modeling. At present he is Director of Agenda: PERU, research associate at the Institute of Development Studies (Sussex University), advisor to the

Primer Minister of Peru and special advisor to the Rector of the University for Peace in Costa Rica.

IFORS: OR for Development Prize Finalist Sessions

Session MA12 Monday, 9:30 - 11:00

Session MC12 Monday, 2:00 - 3:30

Session MD12 Monday, 4:00 - 5:30

Panel and Discussion Sessions

Enhancing Community Capacity through Collaboration, Session RC12

Modeling Science, Session TB22

OR in development, Session TD12

Our most Urgent Need -- Branding the Profession of OR, Session TA14

Tutorials and Semi-Plenary Sessions

Applied Nonlinear Programming, **Leon S. Lasdon**, Session TB5

Collaboration in E-Business: Business Models and Technology Enablers, **Amiya Chakravarty**, Session RA5

Development of a web-based course, **Gary R. Waissi**, Session TC5

Dialog Mapping, **Jeff Conklin**, Session RB5

Global Optimization in Modeling Environments, **Janos D. Pinter**, Session RC5

Measurement and Decisions - Theory, Tools, and Applications, **Jonathan Barzilai**, Session MD5

The Max-Plus Algebra: A new Approach to Performance Evaluation of DES, **Bernd Heidergott**, Session MC5

The Strategic Choice Approach to Planning under Pressure, **John Kimball Friend**, Session MA5

Semi-Plenary: *Max-Plus Algebra and its Applications to Railway Systems*, **Geert Jan Olsder**, Session TA16

Semi-Plenary: *OR Society President's Medal*, **Stewart L. Robinson**, Session RC29

Stream Organizers

(Max,+)-Approach to Dynamic Event Systems; **Wilfried Seidel**, Germany; **Bernd Heidergott**, The Netherlands

Case studies and OR consultancy; **John Ranyard**, United Kingdom

Community Development and Capacity Building; **Letlibe Jacob Phahlamohlaka**, South Africa

Complementarity in Systems Modelling; **Michael Pidd**, United Kingdom

Complex Societal Problems; **Dorien DeTombe**, The Netherlands

Contributed Papers, **Ben Lev**, United States

Cutting and Packing (SICUP workshop); **Jose Manuel Valerio de Carvalho**, Portugal

Data Envelopment Analysis; **Joe Zhu**, United States; **Lawrence Seiford**, United States

Data Mining; **Hussein Abbass**, Australia

Decision Analysis; **George Wright**, United Kingdom; **Gregory S. Parnell**, United States

Decision Making in Banking and Finance; **Francesco M. Paris**, Italy

Education; **Peter C Bell**, Canada

Electricity Markets; **Shmuel Oren**, United States

Electronic Commerce and e-Business; **Amit Basu**, United States

Environmental Management; **Costas P. Pappis**, Greece

Financial Applications and Operations Research; **Stavros Zenios**, Cyprus

Group Decision and Negotiation Support; **L. Alberto Franco**, United Kingdom

Health Services; **Ruth M. Davies**, United Kingdom

Integer and Combinatorial Optimization; **Young-Soo Myung**, Korea

Integer Programming and Discrete Optimization; **J. Cole Smith**, United States

Invited Sessions; **Ben Lev**, United States

Knowledge Management and Intellectual Capital; **John Steven Edwards**, United Kingdom

Maintenance Replacement and Reliability; **Philip Scarf**, United Kingdom; **Joseph C. Hartman**, United States

Managing International Development; **John Kimball Friend**, United Kingdom

Mathematical Programming Applications; **John M. Wilson**, United Kingdom

Metaheuristics; **Arne Lokketangen**, Norway; **Baikunth Nath**, Australia; **David L. Woodruff**, United States; **Fred Glover**, United States

Military Applications; **Gregory S. Parnell**, United States

Multicriteria Decision Aid; **Johan Springael**, Belgium

Multicriteria Decision Analysis; **Theodor J. Stewart**, South Africa

OR and Strategy; **Frances O'Brien**, United Kingdom

OR and the Global Automotive Industry; **Kenneth Chelst**, United States; **Debra Elkins**, United States

OR for Development Prize Competition; **Goutam Dutta**, India

OR in Development; **Rangalal Bandyopadhyay**, India

OR in Forestry; **Andres F. Weintraub**, Chile

Operations Research in Process Industries; **Goutam Dutta**, India

Revenue Management; **Ian Seymour Yeoman**, United Kingdom; **Una Sinead McMahon-Beattie**, Northern Ireland

Scheduling and Timetabling; **Sanja Petrovic**, United Kingdom

Supply Chain Management; **Hochang Lee**, Korea

System Dynamics; **David C. Lane**, United Kingdom

Telecommunications; **Patrick Soriano**, Canada

The History of Operational Research; **Maurice William Kirby**, United Kingdom

Transportation; **Teodor Gabriel Crainic**, Canada

Tutorial/Semi-Plenary, **Ben Lev**, United States

Vehicle Routing; **Jean-Yves Potvin**, Canada

ACKNOWLEDGMENT

Many individuals contributed to the conference. Special thanks to:

Andres Weintraub who guided us in the early stages of the conference planning;

Paolo Toth whose experience as the Program Chair of IFORS '99 helped us resolve many difficult problems;

Lyn Thomas and Chris Barrett who coordinated our activities with the Organizing and local committee;

Lee Freeman who provided valuable computer programming advice and assistance throughout the project; and finally to Dusan Simko who designed, implemented, and maintained the database, the web sites, and the software needed for the project.