



Final Programme

The Programme is correct at the time of going to press (28 May 1999) and is subject to change. The up-to-date version of the Programme is available on the congress Internet site, <http://www.ma.hw.ac.uk/iciam99/>. The Programme was produced from information provided by the participants. This information was subject only to minor editing.

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Printed by Edinburgh Press.

Congress Venue

The Fourth International Congress on Industrial and Applied Mathematics will take place at the University of Edinburgh, George Square Campus from Sunday 4 July to Friday 9 July 1999. Information about all aspects of the Congress can be obtained from staff at the Chaplaincy Centre which is at 1 Bristo Square.

Patrons

The Joint Patrons of the Congress are H.R.H. The Prince Philip, Duke of Edinburgh, K.G., K.T. and The Right Hon. The Lord Mackay of Clashfern.

Message from the Lord Provost of Edinburgh, Eric Milligan

As Lord Provost of Edinburgh, I am delighted to welcome you to the City for the Fourth International Congress on Industrial and Applied Mathematics. I would like in particular, to welcome those of you who are visiting Edinburgh for the first time. I know that you will have a very busy time attending the Congress, but I do hope that in the course of your visit you will be able to enjoy something of Edinburgh and its many attractions.

Edinburgh is a beautiful, dynamic, prosperous European city, benefiting from a unique architectural heritage and a magnificent natural setting. It is host to many thousands of visitors who come here throughout the year to enjoy numerous cultural and sporting events such as "Edinburgh's Hogmanay" and the Edinburgh International Festival.

Edinburgh is also the home of government, law, the churches and banking in Scotland and enjoys a reputation for academic excellence and for offering a superb quality of life to those who live and work here. With a Scottish Parliament being established in the city for the first time in three hundred years, Edinburgh will enter the next Millennium as a more complete capital city.

I do hope that you will enjoy attending this important Congress in Edinburgh. I hope the Congress will be successful and I hope that you will come back to Edinburgh again on many future occasions whether it be for leisure or business.

Message from the Chairman of ICIAM 99, Sir Michael Atiyah

It is a great pleasure to welcome all the participants to the Fourth International Congress of Industrial and Applied Mathematics. ICIAM 99 follows the tradition of its successful predecessors in Paris (87), Washington (91) and Hamburg (95). We have laid on what we hope you will find an interesting and varied scientific programme. We also hope you will enjoy the social occasions and that you will take the opportunity to explore this beautiful city.

Acknowledgements

The Congress is grateful to the following organisations and companies (listed in alphabetical order) for generous financial assistance towards the success of ICIAM 99.

- Bacon & Woodrow
- The Bank of England
- The Bank of Scotland
- Cambridge Environmental Research Consultants Ltd
- Cambridge University Press
- Edinburgh Mathematical Society
- Edinburgh Parallel Computing Centre (EPCC)
- Engineering and Physical Sciences Research Council
- European Office of Aerospace Research and Development, Air Force Office of Scientific Research, United States Air Force Research Laboratory
- Faculty of Actuaries
- Hewlett-Packard
- Institute of Actuaries
- The Institute of Mathematics and its Applications (IMA)
- The International Centre for Mathematical Sciences (ICMS)
- Jaguar Cars
- The London Mathematical Society
- Lothian and Edinburgh Enterprise Ltd
- The Metereological Office
- Microsoft
- The Numerical Algorithms Group (NAG)
- Oxford University Press
- Rothschilds
- The Royal Society
- Schlumberger
- Scottish Widows
- Springer Verlag
- Standard Life
- Trinity College, Cambridge

Member Societies of the Committee for International Conferences on Industrial and Applied Mathematics (CICIAM)

- ANZIAM** Australia and New Zealand Industrial and Applied Mathematics
- CAIMS/SCMAI** Canadian Applied and Industrial Mathematics Society / Société Canadienne de Mathématiques Appliquées et Industrielles
- CSIAM** Chinese Society for Industrial and Applied Mathematics
- ECMI** European Consortium for Mathematics in Industry
- GAMM** Gesellschaft für Angewandte Mathematik und Mechanik
- IMA** Institute of Mathematics and its Applications
- JSIAM** Japan Society for Industrial and Applied Mathematics
- KSIAM** Korea Society for Industrial and Applied Mathematics
- NORTIM** Nordiska Föeningen för Tillämpad och Industriell Matematik
- SBMAC** Sociedade Brasileira de Matemática Aplicada e Computacional
- SEMA** Sociedad Española de Matemática Aplicada
- SIMAI** Società Italiana di Matematica Applicata e Industriale
- SMAI** Société de Mathématiques Appliquées et Industrielles
- SIAM** Society for Industrial and Applied Mathematics

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Timetable Structure

	Monday	Tuesday	Wednesday	Thursday	Friday	
9:15	Opening Session	Chapman, Greengard	Engl, Kelly	Constantin, Wright	Oleinik, Parrinello, Yuan	9:00 9:45
10:30		Johnson, Virga	Pesch, Popescu	Kennedy, Sethian	Mini-Symposia	10:05
11:00	Mini-Symposia	Mini-Symposia, Contributed Lectures and Poster Sessions	Mini-Symposia, Contributed Lectures and Poster Sessions	Mini-Symposia, Contributed Lectures and Poster Sessions		
13:00						
					Mini-Symposia	13:00
14:00 14:45	Friedman, Lenstra	Avellaneda, Bathe	Jameson, Linan	Dongarra, Moffatt, Müller		15:00
14:55 15:40	Merten, Moran	Kikuchi, Tezuka	Berestycki, Pironneau	Hassanzadeh, Keshet, Kida		15:20
16:00	Mini-Symposia and Contributed Lectures	Mini-Symposia, Contributed Lectures and Poster Sessions	Mini-Symposia, Contributed Lectures and Poster Sessions	Mini-Symposia, Contributed Lectures and Poster Sessions	Congress Review and Closing Ceremony	16:20
18:00						
19:00		19:00 Congress Reception Royal Museum				
20:30			20:00 Scottish Evening Teviot Row House	20:00 Film Evening George Square Lecture Theatre		

How to use the Programme

The Congress programme consists of plenary lectures, mini-symposia, contributed lectures and posters. The Timetable Structure gives an overview of the programme. To find your way through the programme we suggest that you use the Contents on page 5, the Index of Organisers on page 174 and the Index of Speakers on page 184.

Details of the programme in chronological order begin on page 10. Each day is divided into a morning and afternoon session. An overview followed by a detailed programme is given for each session. The explanation of abbreviations for room names in the overview sections can be found below.

The abstracts of the plenary lectures and the summaries of the mini-symposia are contained in this book, whereas the abstracts of the minisymposia talks, the contributed lectures and the poster presentations are contained in the Book of Abstracts.

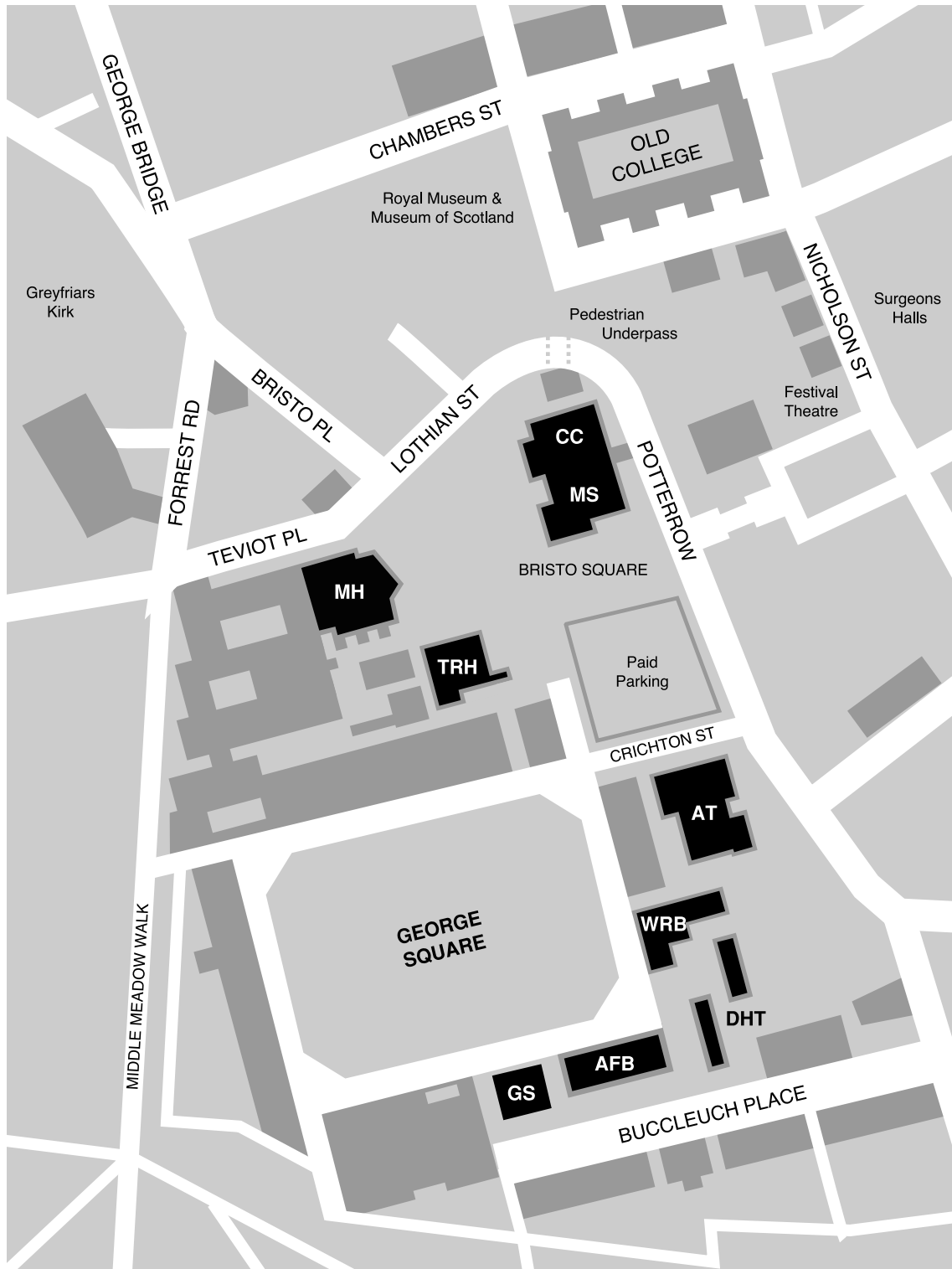
In this book, the page reference in brackets on the right-hand side of the title of a lecture refer to the page number in the Book of Abstracts where the abstract can be found (if submitted to organisers in time).

Because of space limitations, only the name of the presenting speaker is included in the Programme and the Index. Details of co-authors are contained in the abstracts.

The updated electronic version of the Final Programme is available (before, during, and after the Congress) on the ICIAM99 web page,

<http://www.ma.hw.ac.uk/iciam99/>

Site Map



Building and Room Codes

McEwan Hall	MH
George Square Lecture Theatre	GS
Chaplaincy Centre	CC
Teviot Row House	TRH
Appleton Tower	AT
Appleton Tower, Lecture Theatre 1	AT-1
Appleton Tower, Lecture Theatre 2	AT-2
Appleton Tower, Lecture Theatre 3	AT-3
Appleton Tower, Lecture Theatre 4	AT-4
Appleton Tower, Lecture Theatre 5	AT-5
Appleton Tower, Seminar Room 6	AT-6
Appleton Tower, Seminar Room 8	AT-8
Appleton Tower, Room 2.A1	AT-2.A1
Appleton Tower, Room 2.A2	AT-2.A2
Appleton Tower, Room 2B	AT-2B
Appleton Tower, Room 2C	AT-2C
Appleton Tower, Room 2D	AT-2D
Appleton Tower, Room 2E	AT-2E
Appleton Tower, Room 2F	AT-2F
Adam Ferguson Building	AFB
Adam Ferguson Building, Room 10	AFB-10
Adam Ferguson Building, Room 13	AFB-13
Adam Ferguson Building, Room 14	AFB-14
Adam Ferguson Building, Room 17	AFB-17
Adam Ferguson Building, Room 18	AFB-18
Adam Ferguson Building, Room 19	AFB-19
Management School	MS
Management School, Lecture Theatre 1	MS-1
Management School, Lecture Theatre 3	MS-3
Management School, Lecture Theatre 4	MS-4
Management School, Lecture Theatre 5	MS-5
David Hume Tower	DHT
David Hume Tower, Lecture Theatre B	DHT-B
David Hume Tower, Lecture Theatre C	DHT-C
David Hume Tower, Faculty Room North	DHT-N
David Hume Tower, Faculty Room South	DHT-S
David Hume Tower, Room 3.01	DHT-3.01
David Hume Tower, Room 3.18	DHT-3.18
David Hume Tower, Room 4.01	DHT-4.01
David Hume Tower, Room 4.18	DHT-4.18
David Hume Tower, Lower Foyer	DHT-LF
William Robertson Building	WRB
William Robertson Building, Seminar Room 1	WRB-1
William Robertson Building, Seminar Room 2	WRB-2
William Robertson Building, Seminar Room 3	WRB-3
William Robertson Building, Seminar Room 4	WRB-4
William Robertson Building, Lecture Theatre 8	WRB-8
William Robertson Building, Seminar Room 11	WRB-11
William Robertson Building, Seminar Room 9	WRB-9
William Robertson Building, Seminar Room 10	WRB-10