

# **ICMI**

## **Bulletin**

of the  
International Commission  
on  
Mathematical Instruction

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The International Commission on Mathematical Instruction

**ICMI**

**Bulletin No. 31**

**December 1991**

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Legend: IMU stands for *The International Mathematical Union*; ICSU stands for *The International Council of Scientific Unions*; CTS stands for *The Committee on the Teaching of Science* (of ICSU).

# ICME-7 NEXT SUMMER IN QUÉBEC

by Jeremy Kilpatrick

The Seventh International Congress on Mathematical Education (ICME-7) will be held at Université Laval, Québec, Canada, from August 17 to 23, 1992. This will be the first ICME in North America since the ICME-4 at Berkeley in 1980. Université Laval is close to the historic walled city of Québec, the first site in North America to be declared part of the world's heritage by UNESCO. The congress is being organized on behalf of ICMI by the Canadian National Committee for ICME-7. The ICMI congresses are held every four years, alternating in even-numbered years with International Congresses of Mathematicians.

ICME-7 is expected to attract around 3,000 mathematics teachers, teacher educators, mathematicians, curriculum developers, and researchers in mathematics education. Because mathematics education touches many disciplines but is not a discipline itself, its international congresses are organized differently than those of mathematics. The seven days of ICME-7 will contain a mixture of lectures and discussion sessions, together with posters, videotaped national presentations, projects, exhibitions, and workshops. An excursion is scheduled for one of the days. The program will allow ample opportunities for choice and for interaction with colleagues. English and French are the official languages, with most sessions expected to be in English and some services in Spanish.

Topics that are likely to receive considerable attention at the congress include the use of new technology in mathematics teaching, the social and cultural contexts of mathematics education, assessment and its effects, and national efforts to promote curriculum change. Congress participants will have many opportunities to hear about developments in mathematics and in mathematics education around the world. **Ple-nary addresses** are to be given by Geoffrey Howson (U.K.), Colette Laborde (France), and Benoit Mandelbrot (U.S.A.). The 40 or so **lec-turers** include A.D. Alexandrov (U.S.S.R.) on geometry as an element

of general culture, Desmond Broomes (West Indies) on mathematics education in the Caribbean, Yves Chevallard (France) on a social ethic for mathematics teaching, Michael Closs (Canada) on mathematicians and mathematics education in ancient Mayan society, Miguel de Guzmán (Spain) on the evolution of the theory of differentiation of integrals, Fred Goffree (Netherlands) on the life and work of Hans Freudenthal, Ron Graham (U.S.A.) on applied discrete mathematics, Bernard Hodgson (Canada) on nonstandard analysis and the teaching of calculus, George Joseph (U.K.) on contrasting styles of mathematical argument in India and the West, Glenda Lappan (U.S.A.) on teacher education in mathematics, and Jack van Lint (Netherlands) on the present state of discrete mathematics.

A special half-day miniconference on calculators and computers will be held the first afternoon of the congress. The miniconference will consist of introductory talks, demonstrations, simulated classrooms, and short presentations. Participants will work in one of five groups according to their interest in different levels of education.

Each participant will also select one of 23 working groups in which to work for four 90-minute sessions, one each morning for four of the congress days. The **working groups** (and their chief organizers) are as follows:

- WG1 Formation of elementary mathematics concepts at the primary level (Helen Mansfield, Australia)
- WG2 Students' misconceptions and inconsistencies of thought (Shlomo Vinner, Israel)
- WG3 Students' difficulties in calculus (Michèle Artigue, France; Gontran Ervynck, Belgium)
- WG4 Theories of learning mathematics (Pearla Nesher, Israel)

- WG5 Improving students' attitudes and motivation (Gilah Leder, Australia)
- WG6 Pre-service and in-service teacher education (John Dossey, USA)
- WG7 Language and communication in the classroom (Heinz Steinbring, Germany)
- WG8 Innovative assessment of students in the mathematics classroom (Zoltán Báthory & Júlia Szendrei, Hungary)
- WG9 Differentiation of mathematics programs within and between classes (Skip Kifer, USA)
- WG10 Multicultural and multilingual classrooms (Patrick Scott, USA)
- WG11 The role of geometry in general education (Rina Hershkowitz, Israel)
- WG12 Probability and statistics for the future citizen (James Schultz, USA; Mary Rouncefield, UK)
- WG13 The place of algebra in secondary and tertiary education (Carolyn Kieran, Canada)
- WG14 Mathematical modeling in the classroom (Trygve Breiteig, Norway)
- WG15 Undergraduate mathematics for different groups of students (Daniel Alibert, France)
- WG16 The impact of calculators on the elementary school curriculum (Hilary Shuard, UK)



- WG17 Technology in the service of the mathematics curriculum (Klaus-Dieter Graf, Germany)
- WG18 Methods for implementing curriculum change (Hugh Burkhardt, UK)
- WG19 Mathematics for premature school leavers (Carlos Vasco, Colombia)
- WG20 Mathematics in distance education (Gordon Knight, New Zealand)
- WG21 The public image of mathematics and mathematicians (Tom Cooney, USA)
- WG22 Mathematics education with reduced resources (Fidel Oteiza, Chile)
- WG23 Methodologies for research in mathematics education (Norbert Knoche)

In the afternoons, there will be opportunities for participants to present **short communications** through posters, videotapes, or computer software. There will be **exhibitions** of mathematics in arts and crafts and of children's work, workshops on games and other activities, and a "math trail."

Also in the afternoon will be meetings of various topic groups and study groups. Each participant can choose one of 16 topic groups and meet with the group for a 90-minute session on each of two afternoons. The **topic groups** (and their chief organizers) are as follows:

- TG1 Mathematics competitions (Edward Barbeau, Canada)
- TG2 Ethnomathematics and mathematics education (Ubiratán D'Ambrosio, Brazil)

- TG3 Mathematics for work: vocational education (Rudolf Strässer, Germany)
- TG4 Indigenous peoples and mathematics education (Bill Barton, New Zealand)
- TG5 The social context of mathematics education (Alan Bishop, UK)
- TG6 The theory and practice of proof (Gila Hanna, Canada; Niels Jahnke, Germany)
- TG7 Mathematical games and puzzles (Tibor Szentivanyi, Hungary)
- TG8 Teaching mathematics through project work (Jarkko Leino, Finland)
- TG9 Mathematics in the context of the total curriculum (John Mack, Australia)
- TG10 Constructivist interpretations of teaching and learning mathematics (John Malone & Peter Taylor, Australia)
- TG11 Mathematics and Ibero-American art (Rafael Pérez-Gómez, Spain)
- TG12 Graduate programs and formation of researchers in mathematics education (Hans-Georg Steiner, Germany)
- TG13 TV in the mathematics classroom (David Roseveare, UK)
- TG14 Cooperation between theory and practice in mathematics education (Falk Seeger, Germany)
- TG15 Statistics in the school and college curriculum (Richard Schaeffer, USA)

TG16 Philosophy of mathematics education (Paul Ernest, UK)

Each of the three ICMI **study groups** (the International Group for the Psychology of Mathematics Education, the International Group on the Relations Between History and Pedagogy of Mathematics, and the International Organization of Women and Mathematics Education) will organize four 90-minute sessions. Three of the recent **studies produced by ICMI** (on the influence of computers and informatics, the popularization of mathematics, and assessment and its effects) will each be presented in two or four 90-minute sessions.

The congress will provide an unparalleled occasion for anyone interested in the teaching and learning of mathematics to find out what is happening elsewhere in the world, to meet old and new friends, and to exchange views on theory, research, and practice. The Second Announcement is available now. It contains not only more information about the program but also forms for registration, accommodation, and short presentations. It can be obtained by writing to Congrès ICME-7 Congress, Université Laval, Québec, QC, Canada G1K 7P4, by telephone to (418) 656-7592, by fax to (418) 656-2000, by e-mail to ICME-7@VM1.ULAAVAL.CA, or by telex to (021) 051-31621 UNILAAVAL QBC. Registration fees are less if paid before June 15, 1992, and are even lower if paid by December 15, 1991. Applications for accommodation must be made by July 1st, and applications to make a short presentation must be made by January 31st. Full program details will be contained in the Third Announcement, which will be available in April and will be sent to those who register by June 15th.

Jeremy Kilpatrick, Professor of Mathematics Education at the University of Georgia, is a member of the International Program Committee for ICME-7.

## **ICME-8, 1996: Sevilla, Spain**

It is a pleasure for the Executive Committee of ICMI to announce its decision about the venue for The Eighth International Congress on Mathematical Education (ICME-8) which is to be held in 1996. The Executive Committee was happy to accept the bid from Spain to host the congress in **Sevilla**. Most probably the congress will be held in August.

## **ICME-9, 2000: Call for bids**

At the turn of the millennium, in the year 2000, it will be time to hold the Ninth International Congress on Mathematical Education (ICME-9). The Executive Committee has the pleasure of inviting countries which might be interested in hosting ICME-9 to begin already now to consider preparing bids.

The decision about the venue and dates of ICME-9 will not be made in the near future. However, assuming that several countries might consider it particularly attractive to host in year 2000 the most prestigious event in international mathematics education, the Executive Committee felt that countries should be given ample time to prepare their bids. This announcement is only an early call for bids, and no deadline for the submission of bids has been set yet.

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## THE GENERAL ASSEMBLY OF ICMI

In accordance with the rules and practice of ICMI the next General Assembly of ICMI, the union of the National Representatives and the Executive Committee, will be held at ICME-7 at Université Laval, Québec, Canada. The date and time are **Tuesday 19 August 1992, 18.00 – 20.00**. Information concerning the room of the meeting will be found in the congress materials.

Background material to the General Assembly will be included in the next issue of the Bulletin, No. 32, which is due in June 1992. To this end **National Representatives** and National Subcommissions, as well as the groups affiliated to ICMI, i.e. **PME, ISGHPM, and IOWME**, are **encouraged to send brief reports** for publication in the Bulletin to the Secretary of ICMI **before the end of May 1992**.

National Representatives and Executive Committee members are further kindly requested to reserve the above-mentioned date and time for the General Assembly and to read Bulletin No. 32 prior to the meeting.

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**The International Group for the  
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The Newsletter is available free of charge upon request from the local distributor for your country/region. Information of distributor addresses may be obtained from the Editorial Office.

## NATIONAL SUBCOMMISSIONS

With the aim of extending and consolidating the network of mathematics educators within and between countries, the Executive Committee should like to encourage the establishing of National Subcommissions of ICMI in the membership countries, i.e. the countries that have the right to appoint a National Representative. With a few exceptions, these countries are the same as those which possess Adhering Organisations to ICMI's mother organisation, the International Mathematical Union, IMU. In quite a few countries, National Subcommissions have been established already, in some cases many years ago.

According to item 4 of the IMU Terms of Reference for ICMI, the establishing of a National Subcommission in a country requires acceptance by its Adhering Organisation which also is to appoint (at least) one member of the Subcommission. This member also serves as the National Representative on ICMI for that country. Furthermore, a National Subcommission in its membership should cover all educational levels in the country, including associations of mathematics teachers, university mathematicians, researchers in mathematics education etc.

## NATIONAL SUBCOMMISSION OF NEW ZEALAND

The National Subcommission of New Zealand has recently been formed. It has been acknowledged, with the name of **ICMI- New Zealand**, as a Subcommission of the National Committee for Mathematics of New Zealand. The members of the National Committee are appointed by the Royal Society of New Zealand, and the existence and composition of ICMI-New Zealand has been approved by the Royal Society.

The composition of ICMI-New Zealand reflects the geographical spread of the mathematics teachers and researchers in mathematics education in the country. Presently the members of ICMI-New Zealand are:

**Megan Clark** (Victoria University, Wellington), National Representative of New Zealand on ICMI, *Convenor*

**Gill Thomas** (College of Education, Dunedin)

**Elaine Mayo** (Ministry of Education, Christchurch),

**Gordon Knight** (Massey University, Palmerston North)

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# MATHEMATICS EDUCATION DATABASE: MATHDI

In 1991 the international documentation journal Zentralblatt für Didaktik der Mathematik, ZDM, and the Fachinformationszentrum Karlsruhe in Germany started a new online-database, MATHDI, specifically designed for the mathematics education community.

MATHDI ('mathematical didactics') refers to all publications reviewed in ZDM since 1977. These comprise 45.000 books and papers (from about 400 journals) with an updating rate of about 700 items bimonthly.

MATHDI is easily and quickly accessible from all over the world and is offered via STN International (the Scientific and Technical Information Network). MATHDI is the most comprehensive and up-to-date computerised information service in mathematics and computer science education. It enables STN online users to search for words from a title, from an abstract, from a classification text, or from a set of key words, as well as for names of authors, journals, books, proceedings.

The cost of online searching of course depends on several factors such as the size of the search task, connect time, online and offline print charges etc. An average search in MATHDI with 30 relevant citations would cost about 50 DM.

For further information (also about ZDM), please contact

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## IACME EXECUTIVE COMMITTEE

At the VIII IACME (see also the section 'conferences') a new Executive Committee of IACME, the Inter American Conference on Mathematics Education, was elected. Its members are

**Eduardo Luna**, *President*, The Dominican Republic, p.t. USA

**Fidel Oteiza**, *Vice President*, Chile

**Patrick Scott**, *Vice President*, USA

**Angel Ruiz**, *Secretary*, Costa Rica

**Martha Vilavicencio**, Peru

**Carlos Vasco**, Peru

**Elfriede Wenzelberger**, Mexico

**Ubiratan D'Ambrosio**, *Past President*

## SEFI

### MATHEMATICS WORKING GROUP

SEFI, the European Society for Engineering Education, is a non-profit international organisation founded in 1973. The SEFI Mathematics Working Group was established in 1982 with the following aims

- to provide a forum for the exchange of views and ideas amongst those interested in engineering mathematics;
- to promote a fuller understanding of the role of mathematics in the engineering curriculum, and its relevance to industrial needs;
- to foster co-operation in the development of courses and support materials;
- in collaboration with industry to recognise and promote the role of mathematics in the continuing education of engineers.

The activities of the group include

- the organisation of European Seminars on Mathematics in Engineering Education;
- the organisation of small group meeting on specific themes;
- the collection of information on design, development and method of delivery of courses in engineering mathematics, leading to publication of reports;
- the publication of a newsletter.

The articles in the latest issue of the newsletter, SEFI MATH 2 (September 1991), include *Dick Clements: The Impact of Symbolic Manipulation Systems on Service Mathematics Teaching* and *Nigel Steele: Budapest 1991 - A Report on the 6th European Seminar on Mathematics in Engineering Education*. SEFI MATH 2 is available on request by writing to the editor

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## **Forthcoming ICMI STUDY: Gender and Mathematics Education**

The next study to be conducted in the series of *ICMI Studies* will be devoted to *Gender and Mathematics Education*. A Discussion Document prepared by the Programme Committee (**Gila Hanna**, Canada; **Geoffrey Howson**, UK; **Hans-Georg Steiner**, Germany; **Heleen Verhage**, The Netherlands. **Mogens Niss** is a member ex officio) is under preparation. It will be published in a forthcoming issue of this Bulletin.

## THE FREUDENTHAL INSTITUTE

As it is known, Professor Hans Freudenthal, Utrecht (the Netherlands), died on 13 October 1990 a month after his 85th birthday. It may be considered almost a matter of course to honour the memory of one of the greatest figures in mathematics education by naming the institute he founded after him. This happened on Saturday 14 September 1991, when Rijksuniversiteit Utrecht renamed its research and development group OW & OC, the successor of IOWO, the institute founded by Freudenthal, and inaugurated the **Freudenthal Instituut**, as it is called in Dutch.

The inauguration took place at a ceremony celebrating the memory of Hans Freudenthal and the ten years OW & OC had been in existence. Numerous mathematics educators from all over the world and Hans Freudenthal's family were present at the moving opening ceremony at which Freudenthal's last book *Revisiting Mathematics Education - China lectures* was presented by Professor Hans Bauersfeld, IDM, Bielefeld. (The book is published by Kluwer Academic Publishers, Dordrecht, 1991, 216pp, ISBN 0-7923-1299-6)

The address of the institute is

Freudenthal Instituut, Rijksuniversiteit Utrecht  
Tiberdreef 4, 3561 GG Utrecht, The NETHERLANDS

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# CONFERENCES

## VIII & IX IACME

The VIII IACME (Inter American Conference on Mathematics Education) took place 3 – 7 August 1991 in Miami, Florida (USA). The conference received economic support from UNESCO. The proceedings of the conference will be published by UNESCO in 1992, hopefully before ICME-7.

The IX IACME will take place in Chile in 1995 or in the beginning of 1996.

## ICME-7

The 7th International Congress on Mathematical Education will take place on 17 – 23 August 1992 at Université Laval, Québec, Canada. The Second Announcement is available from

Congrès ICME-7 Congress  
Université Laval  
Québec, QC, G1K 7P4, CANADA

Telephone: +1 (418) 656-7592  
Fax: +1 (418) 656-2000  
E-mail: icme-7@vm1.ulaval.ca  
Telex: (021) 051-31621 UNILAVAL QBC

A presentation of the Congress and its programme is given by Jeremy Kilpatrick's article in the beginning of this issue of the Bulletin.

## ICMI-CHINA REGIONAL CONFERENCE

The ICMI-China Regional Conference on Mathematics Education was held in Beijing, 5 – 8 August 1991. The conference was organised by an

international programme committee with Zhong Shanji, Beijing Normal University, as Secretary-General. Participants included mathematics educators from Asia, Australia, and the USA. Proceedings are being prepared.

## **ICMI STUDY CONFERENCE ON ASSESSMENT**

As a component in the series of ICMI studies an international study conference on *Assessment in Mathematics Education and Its Effects* was held in Calonge, Costa Brava (Spain) 11 - 16 April 1991. The Local Organising Committee was chaired by Claudi Alsina, Universitat Politècnica de Catalunya, Barcelona (Spain), whereas the International Programme Committee had Mogens Niss, Roskilde University (Denmark), as its chairman.

A little more than 80 invited participants gave presentations and discussed issues such as those outlined in the Discussion Document published in No. 28 (June 1990) of this Bulletin. The aim of the conference was to provide a basis for a new book in the ICMI Study series describing and analysing states and trends in assessment in mathematics education. As a background to this, a volume of pre-proceedings containing 42 papers formed the basis for the work at the conference which consisted of plenary lectures and plenary debates, parallel presentations, and working groups. The Study is in the process of being edited and is likely to be out in the second half of 1992.

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## **ICTMA 5 & 6**

The Fifth International Conference on the Teaching of Mathematical Modelling and Applications, ICTMA 5, with the sub- title "Teaching Mathematics by Applications" was held in Noordwijkerhout, the Netherlands, 9 - 13 September 1991, with about 200 participants. The conference was organised by Jan de Lange and his collaborators at the

Freudenthal Institute, Rijksuniversiteit Utrecht. Proceedings are expected to be published by mid-1992. The Editor-in-Chief is Jan de Lange.

An accumulative Executive Committee has been formed to elect future Conference Chairs, and to decide the sites of the conferences which are held biennially. The committee mainly consists of previous Conference Chairs. It is chaired by

**Ian Huntley**,  
Sheffield City Polytechnic  
Pond Street, Sheffield S1 1WB, ENGLAND.

The next conferences in the series, ICTMA 6, is going to be held at the University of Delaware, USA, August 1993. The Conference Chairman is

**Clifford Sloyer**  
Department of Mathematics, University of Delaware  
Newark, DE 19716, USA

## **ISGHPM**

There will be a meeting of the *International Study Group on the Relations Between History and Pedagogy of Mathematics*. in Toronto on August 9 - 13, 1992, just before ICME-7 in Québec. Contact person:

**V. Frederick Rickey**  
Department of Mathematics and Statistics  
Bowling Green State University  
Bowling Green, OH 43403, USA

## **PME XV & XVI**

The Fifteenth Psychology of Mathematics Education Conference was held in Assisi (Italy) 29 June - 4 July 1991. A three- volumes set of

conference proceedings has been published by Dipartimento di Matematica dell'Università di Genova (Italy) under the editorship of Fulvia Furinghetti.

The Sixteenth PME will be held 7 – 11 August, 1992, in Durham, New Hampshire, USA, a short time before ICME-7.

### **SEACME 6**

SEACME 6, the 6th South East Asian Conference on Mathematics Education, has been scheduled for 7 – 10 June 1993 in Surabaya, Indonesia. The secretary is

#### **Susanti Linuwih**

Perum Dosen Blok 1 – 15, Kampus Keputih Sukolilo  
Surabaya 60111, INDONESIA.

### **7th SEFI MATH SEMINAR**

The 7th SEFI European Seminar on Mathematics in Engineering Education will take place at Eindhoven University of Technology in the spring of 1993 (cf. Lennart Råde's article on the SEFI Mathematics Working Group elsewhere in this issue of the Bulletin).



## EDITOR'S REMARKS

This Bulletin is published biannually, in June and December. It is edited by ICMI's Secretary, Mogens Niss. Articles and announcements for forthcoming issues of the Bulletin would be most welcome. They should be sent to the editor at the ICMI Secretariat. The deadline for the next issue, No. 32, is 1 June 1992.

It is planned to produce a list of journals on research and development in mathematics education. The editor would be most grateful to receive information about such journals, including bibliographical and other coordinates.

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