

Report on ICMI activities in 2004

1. Organisation

The 2003-2006 **Executive Committee (EC) of ICMI** had its second and third meetings in 2004. The first of these two meetings took place on February 11-12 in Dortmund, Germany, on the occasion of the Study Conference for ICMI Study 14. The other meeting was held in Copenhagen, Denmark, during the ICME-10 congress. The Committee then met prior to the congress on July 2-4 — with the participation of John Ball, President of the International Mathematical Union —, as well as on July 11, the closing day of ICME-10. Beside these two meetings, the work of the EC in 2004 was conducted by electronic communication under the direction of the President and the Secretary-General.

The **General Assembly of ICMI** was held at the Technical University of Denmark (DTU), on the occasion of ICME-10, on Friday July 9, 2004, from 19:45 to 22:05.

The Executive Committee of IMU appointed in 2004 one of its members, Victor A. Vassiliev, to act as an **IMU liaison** with the ICMI EC. Following the sudden passing in November 2003 of Andrey A. Bolibruch, who had been elected as a member-at-large of the IMU EC during the 2002 General Assembly of IMU, Vassiliev had been coopted as a member of the IMU EC, and then elected through a postal ballot held in August 2004. Considering the difficulty for the President and Secretary of IMU, who are *ex officio* members of the ICMI EC, to regularly attend the ICMI EC meetings, such a direct contact between the Executive Committees of the two organisations is a highly welcome addition.

There were no new **member countries** of IMU or ICMI during 2004, nor new ICMI Sub-Commissions. Among the 82 members of ICMI, 18 had in 2004 no appointed Representatives to ICMI (Armenia, Bosnia and Herzegovina, Brunei Darussalam, Estonia, Greece, Kazakhstan, Kuwait, Pakistan, Peru, Romania, Russia, Saudi Arabia, Senegal, Slovenia, Tunisia, Turkey, Ukraine, Uruguay) and one country had an observer status to the IMU. Among the remaining 63 member countries, 10 could still not be reached by e-mail. During 2004, a total of thirteen collective e-mail messages were sent by the Secretary-General to the ICMI Representatives. Most of these messages provided general information on ICMI and its activities and were intended for further dissemination within each country. But others were giving information more specific to the ICMI representatives (vg in preparation for the ICMI General Assembly held during ICME-10) or asking for input from the representatives.

As reported in the 2000-2004 Report of Activities (see ICMI Bulletin No. 54, June 2004, pp. 32-48), the IMU Executive Committee had received from the 2002 General Assembly the mandate to make more transparent the whole **election procedures** for the various elected committees of IMU and to avoid the potential for conflicts of interest in the procedure of selection of slates. In response to the resolution adopted to that effect by the IMU GA, proposals for new rules of appointment of

the Nominating Committee for the ICMI election were drafted by the IMU EC and sent to the ICMI EC during 2003. The ICMI EC concluded that these proposals of IMU did not pay sufficient attention to the specificity of ICMI and were *de facto* moving away from a context where the ICMI community could play a significant role in the selection of its governing body. Discussions on this issue were pursued in 2003 and early 2004, and finalised during the meeting of the ICMI Executive Committee held just prior to ICME-10 — this allowed for an announcement to be made at the General Assembly of ICMI, held during ICME-10 in Copenhagen, about the procedure agreed by the IMU and ICMI ECs. A major effect of this change, which is quite historic for ICMI, is that the actual election of the ICMI EC will be in the hands of the ICMI GA, starting with the GA to be held in 2008 during ICME-11. However any future amendments to the proposed procedure will still be under the jurisdiction of the GA of IMU. A report on the new election procedure for ICMI, which still needs to be approved by the IMU General Assembly to be held in Spain prior to ICME-11, can be found in the *ICMI Bulletin* No. 55, December 2004, pp. 18-22.

It was decided that the new election process on which the Executive Committees of IMU and ICMI agreed would be used for the **2006 election**, but necessarily on an informal basis (pending approval of the new proposed procedures and structures at the 2006 IMU General Assembly). Consequently a Nominating Committee of ICMI was set up for the 2006 election, with a mandate to prepare the selection of the slate of candidates for the ICMI Executive Committee, but operating informally as an advisory body to the IMU Executive Committee. A call for nomination of candidates to the ICMI Nominating Committee was made in October 2004 to the IMU Adhering Organisations and Committees for Mathematics as well as to the ICMI Representatives.

During 2004, the ICMI community was saddened by the sudden decease on April 14 of **Miguel de Guzmán**, former President of ICMI (1991-1998). Also former Executive Committee members Igor Sharygin (1999-2002), Hans-Georg Steiner (1975-78) and Jacobus H. van Lint (1987-1994) passed away in 2004. *In memoriam* testimonies were respectively published in the *ICMI Bulletin* No. 54, June 2004, pp. 70-81, and No. 55, December 2004, pp. 67-84.

2. ICMEs

The 10th International Congress on Mathematical Education, **ICME-10**, was held at the Technical University of Denmark (DTU) in Copenhagen, Denmark, from July 4 to 11, 2004. This congress was organised through a collaboration of neighbouring countries (the Nordic countries Denmark, Finland, Iceland, Norway, Sweden), a first in the life of ICMI. The congress ICME-10 was attended by 2324 participants from 93 different countries. There were also 389 accompanying persons or exhibitors. The International Program Committee, chaired by Professor Mogens Niss, Roskilde University, had proposed a rich and intensive scientific programme, some components of which — such as the Plenary Interview Session or the five so-called Survey Teams — were highly innovative and very well received. The infrastructure and logistic support offered by the organizers were of excellent quality. The tradition instigated at ICME-8 of imposing a “Solidarity Tax” on all registrations was repeated at ICME-10. It had been announced in the Second Announcement of the congress that an ICME-10 Solidarity Fund would be established to provide support to participants from non-affluent countries by setting aside 10% all the registrations fees. The organisers of ICME-10 finally distributed more than 11% of the registrations fees, thus allowing them to provide support

to 175 participants coming from 55 different countries. The distribution of the money generated for the Fund was made by a Grants Committee, jointly appointed by the congress organisers and the ICMI Executive Committee, which worked autonomously and anonymously, as is customary, in order to minimize potential problems of pressure.

The 11th International Congress on Mathematical Education, **ICME-11**, will be held in Monterrey, México, from July 6 to 13, 2008. The International Program Committee is chaired by Professor Professor Marcela Santillán, Rectora at the Universidad Pedagógica Nacional in México. The composition of the IPC was finalised early in 2005 and is announced in the June 2005, No. 56, issue of the *ICMI Bulletin*.

An official call for bids to host **ICME-12** in 2012 was made by the Secretary-General of ICMI during the closing session of ICME-10. This call also appears in the *ICMI Bulletin* (No. 55, December 2004, pp. 11-12).

The book of Proceedings of **ICME-9** has appeared in 2004. The data for the book are:

Hiroshi Fujita, Yoshihiko Hashimoto, Bernard R. Hodgson, Peng Yee Lee, Stephen Lerman and Toshio Sawada, editors, *Proceedings of the Ninth International Congress on Mathematical Education*. Kluwer Academic Publishers, 2004. ISBN (HB) 1-4020-8093-X; ISBN (PB) 1-4020-7902-8; ISBN (e-book) 1-4020-7910-9.

The book is accompanied by a CD. However a problem occurred in the production of the CD. It is stated in the Preface of the book (p. xii) that “the CD part of these Proceedings contains, in addition to files for the whole content of the book part, vivid scenes of the ceremonies and the IRT, full texts of regular lectures if available, and some scientific animation etc.” As it turns out the “whole content of the book part” is absent from the accompanying CD, as are the “full texts of the regular lectures if available”. The congress organizers have decided to issue a revised and complete version of the CD that will be sent to all ICME-9 participants during 2005.

3. ICMI Studies

The ICMI Executive Committee initiated no new ICMI Study during 2004. There were six on-going Studies, at different stages of organisation.

ICMI Study 12 (*The Future of the Teaching and Learning of Algebra*): Publication in 2004 of the Study volume resulting from this Study. The book has appeared in the New ICMI Study Series published by Kluwer Academic Publishers (NISS 8) and is entitled *The Future of the Teaching and Learning of Algebra: The 12th ICMI Study*. The editors are Kaye Stacey, Helen Chick and Margaret Kendal (University of Melbourne).

ICMI Study 13 (*Mathematics Education in Different Cultural Traditions: A Comparative Study of East-Asia and the West*): Preparation of the ICMI Study volume (NISS 9), under the editorship of Klaus-Dieter Graf (Freie Universität Berlin), Frederick K.S. Leung and Francis Lopez-Real (University of Hong Kong).

ICMI Study 14 (*Applications and Modelling in Mathematics Education*): Holding of the Study Conference at the University of Dortmund, Germany, on February 13-17, 2004. This conference was attended by 90 participants coming from 26 different countries.

ICMI Study 15 (*The Professional Education and Development of Teachers of Mathematics*): Dissemination of the Discussion Document and review of the submitted contributions by the International Programme Committee (IPC), co-chaired by Deborah Ball (University of Michigan) and Ruhama Even (Weizmann Institute of Science), in preparation for the Study Conference to be held on May 15-21, 2005, in Aguas de Lindóia, São Paulo, Brazil.

ICMI Study 16 (*Challenging Mathematics in and beyond the Classroom*): Preparation and dissemination of the Discussion Document by the IPC, co-chaired by Peter J. Taylor (University of Canberra) and Edward J. Barbeau (University of Toronto). The Study Conference is planned to take place in Trondheim, Norway, on June 27 to July 3, 2006.

ICMI Study 17 (*Digital technologies and mathematics teaching and learning: Rethinking the terrain*): Meeting of the IPC in April 2004 at the Institute of Education of the University of London (UK). The co-chairs of the Study are Celia Hoyles (University of London) and Jean-Baptiste Lagrange (IUFM of Reims). The costs incurred by ICMI for this meeting were substantially reduced by a generous grant of 2000 £ from the Royal Society.

Topics currently being considered for **further ICMI Studies** include:

- Proof and proving in mathematics education;
- The teaching of statistics;
- Linking undergraduate disciplines, for example mathematics & biology;
- History of mathematics education.

As a result of the merger in 2004 of Kluwer Academic Publishers with BertelsmannSpringer, the Study Volumes published in the **New ICMI Study Series (NISS)** are now to appear under the label of Springer.

4. Regional Conferences

No ICMI Regional Conference was held in 2004, but the ICMI EC has granted the status of an ICMI Regional Conference to three conferences:

- **ICMI-EARCOME-3** (Third ICMI East Asia Regional Conference on Mathematics Education), to be held in Shanghai, Nanjing and Hangzhou, China, on August 7-12, 2005
- **EMF 2006** (Espace mathématique francophone 2006), to be held in Sherbrooke, Canada, on May 27-31, 2006, and
- **ICMI-EARCOME-4** (Fourth ICMI East Asia Regional Conference on Mathematics Education), which will take place in Penang, Malaysia, in 2007.

Frederick Leung, member of the ICMI EC, sits on the International Programme Committee for EARCOME-3, while Vice-President Michèle Artigue and the Secretary-General are members of the EMF 2006 IPC.

5. Other activities

Preparation for the **centennial of the Commission**, to be celebrated in 2008, was pursued during 2004. Ferdinando Arzarello, of the Università degli Studi di Torino, has been appointed as the Chair of the International Programme Committee and the current plans are for a symposium to be organised in (or near) Rome around May 2008, just prior to ICME-11. The aims of the symposium are to reflect on the evolution of mathematics education during the last 100 years and identify emerging trends in the field. The composition of the IPC was finalised early in 2005 and is announced in the June 2005, No. 56, issue of the *ICMI Bulletin*.

Over the last years, ICMI has been sponsoring, jointly with UNESCO and other bodies, the development of a mathematical exhibition entitled “**Experiencing mathematics**” (formerly called “Why mathematics”), whose aim is to improve the image of mathematics among the general public. This exhibition results from the work of colleagues in France and Japan and ICMI supports it substantially, both in its organisation (Vice-President Michèle Artigue represents ICMI on the core committee in charge of the exhibition) and financially (through a grant of 10 000 USD). IMU is also supporting the exhibition with a grant of 1000 USD. The exhibition was officially launched in Copenhagen in July 2004 on the occasion of ICME-10, and was later shown in October 2004 in Orléans during a congress of a French association of mathematics teachers (APMEP). But its first appearance accessible to the public at large, and in particular to pupils and students, was in December 2004 in Paris. It was then on display at the Maison des Métallos, in partnership with the Mairie of the Cité de Paris, from December 9 to 31 and was visited by more than 4000 people, mainly pupils. Two sets of the exhibit are now available and are being circulated internationally under ICMI auspices. The short-term programme of travel includes Greece, China, South Africa and India. The exhibition is devised so to be evolutionary, for instance by organising a regional and coherent pedagogical design around the exhibition.

Following a recommendation of the Ad Hoc Sub-Committee on “Supporting Mathematics in Developing Countries” appointed in 2003 (see the Report on ICMI Activities in 2000-2004, *ICMI Bulletin* No. 54, December 2004, pp. 32-48), the IMU Executive Committee established in early 2004 the **Developing Countries Strategy Group (DCSG)** with the charge of increasing, guiding and coordinating IMU’s activities in support of mathematics and mathematics education in the developing world. ICMI is represented in the DCSG by Vice-President Michèle Artigue. The first meeting of the DCSG was held at the Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste, Italy, on 16-17 October 2004. Among the actions considered by the DCSG is the creation of a web-based Clearinghouse for African Mathematics, which will be housed at ICTP. ICMI offered to contribute to this project by collecting information about activities linked to mathematics education in Africa, in particular as regards existing associations, projects, master and doctorate programmes in education, and mathematics competitions. The DCSG also approved a grant to support the circulation in Africa of the international mathematics exhibition “Experiencing Mathematics”.

It has been mentioned in previous reports that ICMI has co-sponsored an International Seminar on Policy and Practice in Mathematics Education organised since 2001 in Utah, USA, in the

context of the annual **Park City Mathematics Institute (PCMI)** hosted by the Institute for Advanced Study (Princeton, USA). This program has engaged each year mathematics educators from a diverse set of countries in a stimulating five-day discussion about common issues and concerns in the teaching and learning of mathematics, with a particular focus on teacher preparation and development. The 2004 session took place during ICME-10, where many participants from the first three years shared with the larger mathematics education community the outcome of the first seminars and considered with this larger group how to continue the dialogue at future Institutes.

ICMI was invited to join with organisers of the PCMI International Seminar (Gail Burrill, Herb Clemens, Joan Ferrini-Mundy and Johnny Lott) for a meeting with **World Bank** officials. This meeting took place in Washington in September 2004 and ICMI was represented by the Secretary-General. The purpose of this meeting was to examine how the PCMI International Seminar model could be used in approaching issues of mathematics education in developing countries. Interest was expressed by the World Bank about the preparation of a “policy brief” on the education of teachers which could be based on research done for instance in the countries having taken part in the PCMI International Seminar and could also encourage other countries to be involved in research of their own. The World Bank also expressed interest for the ICMI networking capacity with the leadership in mathematics education around the world, as it is connected to scientific societies and individuals in academic institutions, and is thus complementary to the links that the Bank has with governments and ministries of education.

In a similar vein, ICMI has been invited by the Director of Education at **OECD (Organisation for Economic Co-operation and Development)** to participate in a Forum on education and social cohesion organised by OECD on the occasion of a meeting of Education Ministers held in Dublin on March 18-19, 2004. This meeting, where ICMI was represented by the Secretary-General, was a first opportunity for a direct link of ICMI with the OECD Directorate for Education. These contacts were pursued later in the year when the Secretary-General and Vice-President Michèle Artigue met at OECD headquarters in Paris with more people of the OECD Directorate for Education. Interest was then expressed by OECD for the “Pipeline Issue” project (see item 6 below), as well as for the themes of teacher education and development (the topic of ICMI Study 15) and mathematics for the workplace (which has been mentioned in the past as a possible topic for a future ICMI Study).

ICMI has accepted to endorse the candidacy of Mariolina Bartolini Bussi to the **2004 Altran Award for the promotion of science**. The project is based on the work done at the Laboratory of Mathematical Machines at the Department of Mathematics of the Università degli studi di Modena e Reggio Emilia, in Italy (see <http://www.museo.unimo.it/theatrum/>), and concerns the industrial design and construction at reasonable cost and in large number of a small selection of robust mathematical machines. These models would be of two classes: curve drawing devices and instruments for perspective drawing. The objectives are to sell these mathematical instruments at low prices all over the world to schools, institutions and museums, together with pedagogical support (working sheets, didactical analysis, etc.). This project is of particular interest to ICMI as it directly connects to initiatives of the Commission towards the needs of non-affluent countries in mathematics education.

The President and Secretary-General of ICMI were pleased to receive an invitation from the Editor of the *Notices of the American Mathematical Society* to contribute, on the occasion of ICME-10, a paper providing basic information about the Commission — its aims, history, activities, etc. —, keeping in mind the usual readership of the *Notices*. The resulting article, “The International Commission on Mathematical Instruction — What? Why? For Whom?” appeared in the *Notices of the AMS* vol. 51 (6) (June/July 2004) pp. 639-644, and was reproduced with permission in the *ICMI Bulletin* No. 55 (December 2004), pp. 23-31.

6. IMU Concerns about Mathematics Students

The IMU Executive Committee has expressed in recent years concerns about the case of students of mathematics at the university level. Questions raised were related to the quality of teaching and the motivation of students, about how this reflects on the statistics on the number of students choosing to do mathematics at the university level in various countries, and how this has changed over the last 10 or 20 years. The difficulties of enlisting mathematics majors appear to be an internationally widespread phenomenon. Pertinent statistics and their analysis may be of interest to all mathematicians and could be the subject of a report that could be issued and used by individual countries in interaction with their governments.

Discussions between ICMI and IMU has given more emphasis to the theme, which has come to be called the “**Pipeline issue**” and may be seen as related to various aspects of the teaching and learning of mathematics at the higher level. At the ICMI EC meeting held in Copenhagen during ICME-10, it was agreed with IMU President John Ball that ICMI would initiate, in cooperation with IMU, a “Pipeline Issue” project to investigate such matters. A task group, chaired by ICMI EC member Frederick Leung, has been appointed with the mandate to explore the feasibility of implementing such a project and identify potential sources of funding.

7. Affiliated Study Groups

ICMI currently has five Affiliated Study Groups, namely (in the chronological order of their affiliation to ICMI) *HPM* (The International Study Group on the Relations Between the History and Pedagogy of Mathematics) and *PME* (The International Group for the Psychology of Mathematics Education) — 1976, *IOWME* (The International Organization of Women and Mathematics Education) — 1987, *WFNMC* (The World Federation of National Mathematics Competitions) — 1994 and *ICTMA* (The International Study Group for Mathematical Modelling and Applications) — 2003. The quadrennial reports of the Affiliated Study Groups have appeared in the *ICMI Bulletin* No. 54, June 2004, pp. 53-69, while updated information on PME, HPM and IOWME was given in issue No. 55, December 2004, pp. 47-57.

On the occasion of ICME-10, the President and Secretary-General of ICMI were invited to participate in the ceremony of the **Paul Erdős Awards**. These awards were established by the WFNMC to recognise contributions of mathematicians which have played a significant role in the development of mathematical challenges and which have been a stimulus for the enrichment of mathematics learning. In 2004, the recipients were Warren Atkins (Australia), André Deledicq

(France) and Patricia Fauring (Argentina), and the awards were presented by ICMI President Hyman Bass.

8. The Solidarity Program

A new **Ad Hoc Committee** has been appointed in 2003 to review the functioning of the Solidarity Programme and make recommendations to the Executive Committee concerning its orientation and development. The Chair of this Committee, Alan Bishop (Monash University, Australia), is playing in this connection the role of an ICMI Commissioner with a responsibility for solidarity and equity. A preliminary report of the Ad Hoc Committee was received by the EC in June 2004 and presented by the Chair of the Committee at the General Assembly of ICMI held during ICME-10. The report is proposing a series of possible directions that the ICMI Executive Committee is examining. Peter Galbraith, member of the EC, is responsible for the follow up on this dossier.

9. The ICMI Awards and ICMI Logo

The two recipients of the **ICMI Awards in mathematics education research** selected by the ICMI Award Committee for the year 2003 were announced in a press release issued on April 4, 2004 (see *ICMI Bulletin* No. 54, June 2004, pp. 7-11). The first awardees are Guy Brousseau for the 2003 Felix Klein Medal, and Celia Hoyles for the 2003 Hand Freudenthal Medal. The ICMI Awards were presented at the opening ceremony of ICME-10. Lectures by each of the awardees were on the programme of ICME-10. As a sign of recognition, each recipient was given a certificate and a medal. The medals have been designed and produced by students of École Boule, in Paris, while the certificates were designed by students of the Studio École of the School of visual arts of Université Laval, in Québec. More information on these tangible tokens can be found in the *ICMI Bulletin* No. 55, December 2004, pp. 14-15.

Both the medals and the certificate are adorned with the recently adopted **ICMI logo**. The choice of the logo was made by the ICMI Executive Committee at its February 2004 meeting and resulted from a review of more than 35 proposals received. The logo selected was designed by students of the Studio École of the School of visual arts of Université Laval, in Québec. More information on the ICMI logo appears in the *ICMI Bulletin* No. 55, December 2004, pp. 16-17.

10. Information and Communication

ICMI maintains a website located on the IMU server (www.mathunion.org/ICMI/). During 2004, issues Nos. 54 and 55 (June and December) of the *ICMI Bulletin* were published. The cover of issue No. 55 incorporates the newly adopted ICMI logo.

Bernard R. Hodgson, Secretary-General
Université Laval, Québec, Canada
bhodgson@mat.ulaval.ca
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