

ICMI

ICMI Newsletter

A Newsletter from the ICMI-International Commission
on Mathematical Instruction

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1. Editorial – Mathematicians around the world are getting ready for the ICM 2018 in Rio de Janeiro

From the desk of Helge Holden, Secretary of the International Mathematical Union (IMU) and ex-officio member of the Executive Committee of The International Commission on Mathematical Instruction (ICMI).



The starting point of the International Mathematical Union (IMU) was a wish to enhance and stimulate international collaboration in mathematics, and the IMU was founded in 1920, indeed twelve years after ICMI. A core responsibility for the IMU from the start was to organize the International Congresses of Mathematicians – the ICMs.

The first ICM was hosted in 1897 in Zürich, and already the next one in Paris in 1900 has a very special standing in the history of mathematics. At the Paris meeting David Hilbert gave his seminal talk on his selection of 23 open problems in mathematics – forever thereafter denoted the Hilbert-problems. These problems set the stage for the development of mathematics for the 20th century. But there was a need for a more formalized organization behind the international meetings. World War I delayed the creation of the IMU until 1920. However, once more the political development interfered and the IMU was dissolved in 1932, and the last congress before World War II was the one in Oslo in 1936. The IMU was re-created in 1950 with the congress in Cambridge, Massachusetts, USA, and since then the congresses have been hosted every four years.

While all congresses before World War II were hosted in Europe, the selection of host countries after WWII has shown more diversity, reflecting the globalization of modern science, and, in particular, of mathematics. In 2018 we will gather in Rio de Janeiro, Brazil, in 2014, the ICM was hosted in Seoul, Republic of Korea, while the 2010 ICM took place in Hyderabad, India. At the same time, the congresses have increased in size, and attendance is now in the range of 4000 participants; small compared to congresses in medicine, but still huge by our standards. With the increased size, the organization, including both human and financial resources, requires careful planning. And it may be more difficult for smaller countries to host an ICM in the future, which is an unfortunate, but probably unavoidable, development.

The ICMs have followed more or less the same format since its beginning, and there are only invited talks at the congresses; a small number are plenary talks (around 20), and more sectional talks (around 180).

To receive an invitation to give a talk at an ICM is a big boost for the career of a mathematician, and the work of selecting the very small number of speakers is the responsibility of the powerful Program Committee, chaired for the ICM 2018 by Prof. János Kollár (Princeton University). To offer the committee the possibility to work undisturbed, the Program Committee, as well as its numerous sub-committees, are confidential until the opening of the ICM. And the IMU keeps a complete record (available on-line) of all invited speakers from the first congress! By attending an ICM you will hear the best mathematicians talk about the latest research, and it is best way to gauge what is going on in mathematics globally and across all sub-disciplines of mathematics.

The highlight for many, and most certainly for the media, is the opening ceremony, where the winners of the Fields Medal, the Nevanlinna Prize, the Gauss and the Chern Prizes, as well as the Leelaviti prize are announced. The Fields Medal, awarded to up to four mathematicians not older than 40 years, often creates big headlines around the world. Since the Fields and Nevanlinna prizes are given to young mathematicians, in contrast to many lifetime achievement awards, the awardees will be leading the way in mathematics for a long time.

The Leelavati prize, awarded for the first time at the ICM 2010, is intended to recognize outstanding contributions for increasing public awareness of mathematics as an intellectual discipline and the crucial role it plays in diverse human endeavors.

The ICM 2018 in Rio de Janeiro, Brazil, 1–9 August, will be the first time the ICM takes place in Latin America, and the first time in the Southern Hemisphere. Mathematics has been going through an incredible development in Brazil, culminating with Artur Avila being the first Brazilian to receive the Fields Medal at the ICM in 2014. The Brazilian National Congress declared 2017–2018 as the Biennium of Mathematics in Brazil. And in 2017, Brazil hosted the International Mathematical Olympiad (IMO). Thus it is only natural that Brazil is also hosting the ICM in 2018. Brazil is known worldwide for its national mathematics competitions, and the number of participants is staggering! In the Brazilian Public School Math Olympiad (OBMEP) there are more than 18 million participants from grades six to 12. The more selective Brazilian Math Olympiad (OBM) has half a million participants.

Brazil has also other outreach activities. I had the pleasure of attending the Festival da Matemática when I visited Rio, and the enthusiasm I could see in the young people involved in all sorts of mathematical activities, shows great promise for the future of mathematics in Brazil. At the core of many of the mathematical activities on all levels in Brazil is the world-renowned research institution Instituto de Matemática Pura e Aplicada (IMPA), which in addition is the host institution for the ICM 2018 in Rio.

Right now, preparations are going on with full speed; registration is open, and you just have to sign up!

In addition to the specialized talks there will also be a number of panels, e.g., “Use of Lesson Study to Support Quality Mathematics Teaching” and “New Avenues for Raising Public Awareness of Mathematics”. In addition there will a small number of discussion panels, e.g., “The Gender Gap in Mathematical and Natural Sciences from a Historical Perspective”, which is based on large multidisciplinary project funded by the International Council of Science, and run by the IMU Committee on Women in Mathematics.

I hope to see all of you at the ICM 2018 in Rio!

2. Publication of ICMI Study 23

The ICMI Study 23 volume titled "Building the Foundation: Whole Numbers in the Primary Grades" edited by Mariolina Bartolini Bussi and Xu Hua Sun will be available in the coming days. This Study volume is a novelty in both content and format. For the first time ever, an ICMI Study is fully devoted to primary (elementary) school and pre-school. For details on its content and approach, please see <http://www.springer.com/gp/book/9783319635545>

Likewise, it is the first time that an ICMI Study will be published as open access, namely it will be available on the web free of all restrictions and charges on access and free of some restrictions on use. Faithful to its policy of inclusiveness by making knowledge available and accessible to all, ICMI will monitor this trial experience. If this way of publication turns out to be successful and cost effective, ICMI will consider continuing publishing the Studies as open access. A hard copy will be also available at a discounted price.

ICMI is very grateful to the editors of this Volume for their ongoing efforts and dedication throughout the sometimes tortuous path from the very beginning to its happy ending. ICMI also thanks all the International Program Committee members and David Pimm, who volunteered to thoroughly proofread the manuscript.

3. ICMI Study 24- Call for Contributions

As announced in the November 1, 2017 issue of this Newsletter, see item 3 at https://www.mathunion.org/fileadmin/ICMI/files/Publications/ICMI_news/ICMI_Newsletter_November.2017_.pdf the ICMI Study 24 on "School Mathematics Curriculum Reforms: Challenges, Changes and Opportunities" (Tentative title) was launched. Colleagues from all over the world are kindly invited to consider submission of papers to be presented at the ICMI Study Conference. For details and guidelines, please refer to the Discussion Document, which can be seen at <https://www.mathunion.org/icmi/activities/icmi-studies/ongoing-icmi-studies>

4. ISDDE: a new ICMI affiliated organization

Following a submission of a proposal and the deliberation in the ICMI Executive Committee, ICMI welcomes the International Society for Design Development in Education (ISDDE) as an affiliated organization. The International Society for Design Development in Education was formally established in 2005, and it is devoted to improve the impact on education of the design and development of educational materials for others to use, particularly in mathematics and science.

The goals of the Society are to:

- * improve the design and development of educational tools and processes;
- * increase the impact of good design on educational practice;
- * build a design community that will forward these goals.

ISDDE has two levels of membership: Members and Fellows. The Fellows form the ultimate governing body of the Society, electing members of the Executive, and deciding on changes to the Constitution. The Executive meets annually at the conference, with its work, and that of a number of operational committees, being conducted at distance by email and other electronic means. All roles are voluntary.

Current Chair is Lynne McClure from the UK. Approximately half of the Executive, the Fellows, and Members work in mathematics education. ISDDE has published an online refereed journal since 2008.

For more information about ISDDE see <http://isdde.org/isdde/>

5. Call for nominations for the 2020 ICMI Emma Castelnuovo Award (deadline March 31, 2019)

The Emma Castelnuovo Award recognizes outstanding achievements in the practice of mathematics education in order to reflect a main aspect of the ICMI 'essence' not yet recognized in the form of an award. The award was named after Emma Castelnuovo, an Italian mathematics educator born in 1913, in celebration of her 100th birthday and honoring her pioneer work. The first Emma Castelnuovo medal was awarded to Hugh Burkhardt and Malcolm Swan in 2016 during the 13th International Congress on Mathematical Education (ICME-13) in Hamburg, Germany.

The Emma Castelnuovo Award for outstanding achievements in the practice of mathematics education will honor persons, groups, projects, institutions or organizations engaged in the development and implementation of exceptionally excellent and influential work in the practice of mathematics education, such as: classroom teaching, curriculum development, instructional design (of materials or pedagogical models), teacher education programmes and/or field projects with a demonstrated influence on schools, districts, regions or countries. The Emma Castelnuovo Award seeks to recognize and to encourage efforts, ideas and their successful implementation in the field, as well as to showcase models and exemplars of inspirational practices to learn from.

The recipient of the award will be announced late in 2019 or early in 2020, and the award will be conferred at ICME-14 in July 2020 in Shanghai, China. The awardee (or its representative in the case of a group, institution, project, or organization) will be invited to present a special lecture at the Congress.

The Emma Castelnuovo Award Committee consists of a Chair (Professor Konrad Krainer) nominated by the President of ICMI, and five other members who remain anonymous until their terms have come to an end. The six members come from six different countries, representing different continents (Africa, Asia, Australia, Europe, North America and South America). The Committee is completely autonomous, its work and records will be kept internal and confidential, except for the obvious process of soliciting advice and information from the professional community, which is done by the Committee Chair. The Committee is at this time entering the 2020 cycle of selecting awardees and welcomes nominations for the award from persons, groups, projects, institutions or organizations in the mathematics education community.

For information about the other ICMI awards and the names of past awardees, see <https://www.mathunion.org/icmi/awards/icmi-awards>

Nominees for the award will be evaluated in light of the following criteria:

- the educational rationale for the candidate's work and what served as a catalyst for that work;
- the problems addressed by the candidate;
- the candidate's role in addressing the problems, whether they involve curriculum development, teacher education, professional development, design of instruction, or other areas of mathematics education practice;
- the conditions under which the work has taken place (the cultural and political context, infrastructure, funding, and people involved);
- the originality and creativity involved in how the candidate has addressed problems and overcome obstacles;
- the quality of networking with other key stakeholders (e.g., bridging theory and practice);
- external or internal evaluations of the work, if available;
- the extent of the influence of the work on educational practice, including quantitative or qualitative evidence of that influence; and
- the potential of the work to serve as a model (either for inspiring others addressing similar problems or because of taking an approach that could be applied elsewhere with appropriate modifications).

Nominations for the Emma Castelnuovo Award should include the following documents in English language (exceptions for 4. – see below):

1. a document (max. 5 pages) describing the nominee’s programme and reasons for the nomination (including the nominee’s impact on the field);
2. a one-page summary statement;
3. an account of the genesis and dissemination of the nominee’s work and the roles of the people involved, with brief curricula vitae of the key persons (max. 10 pages);
4. electronic copies of three publications that reflect the nominee’s work related to the practice of mathematics education (e.g., journal articles, textbooks, other instructional materials, or CD-ROMs); (if a publication is not written in English, an English translation of a key part – e.g. an abstract – and an independent statement on the publication’s quality written in English – e.g. a review – should be provided)
5. three letters of support (from different stakeholders and, if possible, from different countries); and
6. the names and e-mail addresses of two persons who could provide further information, if needed.

All nominations must be sent by e-mail to the Chair of the Committee (konrad.krainer@aau.at) no later than **March 31, 2019**.

Konrad Krainer
Chair of the ICMI Castelnuovo Award Committee
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Sterneckstraße 15
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Austria

6. The success story of the NEW ICMI STUDY SERIES (NISS)

The NEW ICMI STUDY SERIES (NISS) has been published with Springer since 1993 and has since then produced a total number of 18 volumes with the 19th one about to be published soon!

We recently took a look at the ‘numbers’ of the Series and we were overwhelmed by the on-going success, in terms of readership, of the books published within this Series.

A development of great benefit to this success story was of course the rise of the eBook in 2005 and once the conquest of the eBook was a fact, Springer ensured that each book became available in both print and electronic versions. Even the books published before 2005 were digitized and became widely available as an eBook which means that even the first volume of the Series, published in 1993, today still has an impressive number of eBook downloads. In fact, many of the volumes published before 2010 are still highly popular today, with most of them easily surpassing an annual 5,000+ (eBook) download figure in 2017.

This leads us to believe that the ICMI Study Series volumes are true timeless classics, and can perhaps even be stamped as ‘reference works’, leading the way for mathematics education research for decades to come. We look forward to welcoming the 23rd ICMI Study Building the Foundation: Whole Numbers in the Primary Grades in March and are thrilled with the huge impact this work will no doubt have as the first full Open Access publication in the Series.

Natalie Rieborn,
Associate Editor Education, Springer

7. Upcoming Conferences

- 8th ICMI-East Asia Regional Conference on Mathematics Education (EARCOME), Taiwan, May 7-11, 2018, <http://earcome8.math.ntnu.edu.tw/>
 - 42nd Annual Meeting of PME, Umeå, Sweden July 3 -8, 2018, <http://www.pme42.se/>
 - 8th European Summer University on History and Epistemology in Mathematics Education, Oslo, Norway, July 20-24, 2018, <https://esu8.edc.uoc.gr/>
 - AFRICME (The Africa Regional Congress of ICMI on Mathematical Education), August 29-31, 2018, Aga Khan University, Dar es Salaam, Tanzania.
<http://www.mathunion.org/icmi/conferences/icmi-regional-conferences/conferences-to-come/>
 - The next CIEAEM conference (CIEAEM 70) will be held in Mostaganem, Algeria, 15-19 July 2018. The conference theme « Mathematics and Living together » is in perfect harmony with the Commission's orientations since its creation. For more information, visit: <https://cieaem70.sciencesconf.org/>
 - The seventh EMF colloquium (EMF2018) will take place in Paris, from October 22 to 26, 2018. The theme of the colloquium is "Mathematics on the stage, bridges between disciplines." The colloquium includes 12 working groups, 5 special projects, and actions and events. For more information, visit: <https://emf2018.sciencesconf.org>
 - CERME 11 (in 2019) will take place in Utrecht in the Netherlands in February 5-10, 2019. For more information please visit: <http://www.mathematik.uni-dortmund.de/~erme/index.php>
 - CIAEM-15 (XV Inter-American Conference on Mathematics Education) will be held in in Medellín, Colombia, May 5-9, 2019. For more information, visit:
<http://ciaem-redumate.org/conferencia/index.php/xvciaem/xv>
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