

A SHORT OVERVIEW OF ICMI (OCTOBER 2024)

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The aim of this short text is to give an overview of ICMI and its activities.

ICME and ICMI: a C story	2
ICMI a commission created more than a hundred years ago	2
ICME a congress created more than 50 years ago	3
Some figures on ICME-15	4
ICMI as an organization	7
ICMI Executive Committee	7
ICMI Country Representatives	8
ICMI Affiliate Organizations	9
Communication	10
IMU Secretariat and ICMI Finances	11
ICMI activities	11
ICMI Studies	12
Capacities and Networking Projects – CANP	13
ICMI Awards	14
ICMI Awardees Multimedia Online Resources project – AMOR	16
Klein project	17
Database Project	17
International Day of Mathematics	18

First, I would like to clarify a point which is always a source of mistakes, that is the distinction between two very similar acronyms that many people get confused about: ICMI and ICME!

ICME AND ICMI: A C STORY

Even if the only visible difference is between the last letters (E for Education versus I for Instruction), this not where the fundamental difference is, but in the signification of the C. Indeed, **ICME** stands for International **Congress** on Mathematical Education, while **ICMI** stands for International **Commission** on Mathematical Instruction.

ICMI a commission created more than a hundred years ago

The origins of the Commission ICMI have to be traced back to the late nineteenth century, a period of intense mobilization of scientists and mathematicians worldwide to defend the idea that school curricula should include more scientific contents and contribute more to the instruction of citizens of this new industrial era. It is in this trend that two mathematicians, Henri Fehr from Geneva (Switzerland) and Charles-Ange Laisant from Paris (France) launched, in 1899, the Journal *L'Enseignement Mathématique*, which is still published in Geneva and is historically connected to ICMI since 1908. In 1897, in Zürich, the first International Congress of Mathematicians was held. The second Congress happened in Paris in 1900 and since then, apart from a break of 12 years between 1936 and 1950, these Congresses were held regularly every 4 years in various cities in the world.

During the fourth Congress in Rome in 1908, a meeting was organized and led to the constitution of a commission known in German as *die Internationale Mathematische Unterrichtskommission*, in French as *la Commission internationale de l'enseignement mathématique*, in Italian, as *la Commissione internazionale dell'insegnamento matematico*, and in English as the *International commission on the teaching of mathematics*. It is only since 1952 that the present denomination as ICMI appeared.

During the meeting an executive committee was created with Felix Klein as president, Henri Fehr as Secretary General and George Greenhill as Vice-President.

If you want to know more about the history of ICMI, there is plenty of information on the website: <https://www.mathunion.org/icmi/organization/historical-sketch-icmi>

Here is a list of key dates and events:

- 1952 – Re-organization: ICMI which becomes a sub-commission of IMU
- New math reform
- 1960-1980 Mathematics education (didactics of mathematics) becomes an academic field.
- Influence of Hans Freudenthal
- 1968 – International journal *Educational Studies in Mathematics*
- 1969 – First International congress on mathematical education (ICME) in Lyon (Maurice Glayman)
- 1985 – First ICMI Study (Jean-Pierre Kahane and A. Geoffrey Howson)
- 2003 – ICMI Awards introduced (Klein and Freudenthal medals)

- 2016 – Emma Castelnuovo Award introduced
- 2007 – Michèle Artigue becomes the first female President of ICMI and the first mathematics educator to serve as ICMI President
- Michèle Artigue, with Bernard Hodgson as Secretary-General, shaped the new ICMI, already initiated under successive presidencies of Miguel De Guzman and then Hyman Bass with Mogens Niss as Secretary-General.
- One of the new pillars of ICMI are the activities for developing countries, supported by IMU, CDC and UNESCO.
- It is in this context the first CANP Project was initiated in 2010 in Sub-Saharan Africa under the presidency of Bill Barton, with Michèle Artigue as leader.

ICME a congress created more than 50 years ago

The first ICME Congress was held in 1969 in Lyon (France), at a time when Hans Freudenthal was the President of ICMI, with André Delessert (from Switzerland) as Secretary-General and Edwin Moise (USA) and Sergei L. Sobolev (USSR) as Vice-Presidents. Among the plenary speakers were many prominent figures of the time like: E. Fischbein, E. Castelnuovo and A. Revuz.

The second Congress was held in Exter (UK) in 1972. From there the congresses took place regularly every 4 years (except for ICME-14) until ICME-15 now in Sydney (Australia) in 2024.

ICME-1	ICME-2	ICME-3	ICME-4	ICME-5
1969	1972	1976	1980	1984
Lyon (France)	Exeter (UK)	Karlsruhe (Germany)	Berkeley (USA)	Adelaide (Australia)
ICME-6	ICME-7	ICME-8	ICME-9	ICME-10
1988	1992	1996	2000	2004
Budapest (Hungary)	Québec (Canada)	Sevilla (Spain)	Tokyo (Japan)	Copenhagen (Denmark)
ICME-11	ICME-12	ICME-13	ICME-14	ICME-15
2008	2012	2016	2021	2024
Monterrey (Mexico)	Seoul (Korea)	Hamburg (Germany)	Shanghai (China)	Sydney (Australia)

Table 1: List of all ICMEs



Figure 1. Front pages of all ICME Proceedings

All information on the ICMEs, including the proceedings in Open Access, is on the ICMI website: <https://www.mathunion.org/icmi/icme/past-icmes>

The next Congress, ICME-16 will be held in Prague (Czech Republic), in July 2028.

The ICMI EC has just chosen the ICME-16 IPC (most names are yet not official), which comprises: Nad'a Vondrová (Convenor/ IPC chair), David Janda & Ladislav Kvasz (LOC co-chair), 1 more nominee from CZ or the region, ICMI President and Secretary-General, the immediate past ICME convenor, 1 IMU nominee and 14 selected members.

The preliminary declaration of intention of presenting a bid to act as host for ICME-17 (2032) should be received by the Secretary-General of ICMI by December 1, 2025.

The last Congress ICME-15 was held in Sydney in July 2024

Some figures on ICME-15

Despite the post-COVID era and the distance that many participants had to travel to come to Sydney, ICME-15 was very successful:

Total of participants – 2'393
Total presentation speakers – 2065
Solidarity Fund awardees - 197
Total countries of attendees – 97

With delegates from a wide range of countries: the largest contingents were from: United States: 493 (20.6%) Australia: 410 (19.8%) China: 174 (7.8%) Japan: 158 (6.6%) Germany: 145 (6.6%) Canada: 78 (3.6%) India: 53 (2.13%).

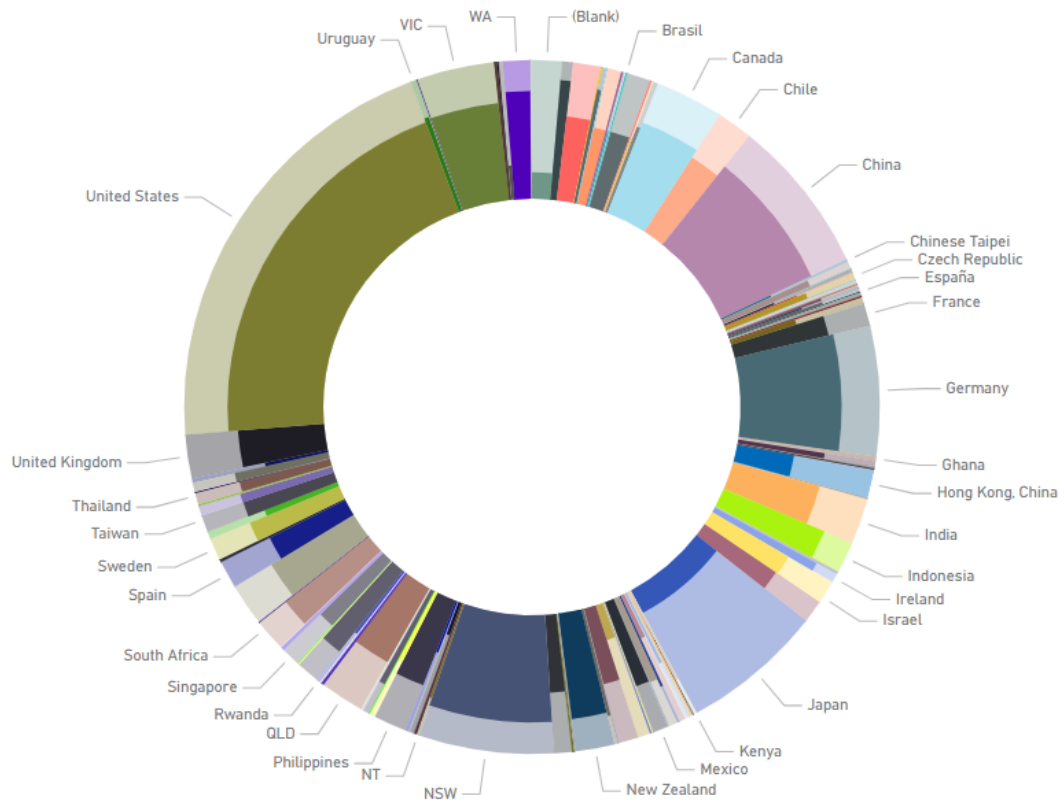


Figure 2 – Distribution of ICME-15 delegates by countries



Figure 2bis – Distribution of ICME-15 delegates by countries

There were 197 delegates who benefited from support from the Solidarity Fund.

Afghanistan - 1	Cook Islands - 1	Mexico -2	Niue -1	Thailand - 3
Algeria -1	Costa Rica - 2	Mongolia – 1	Pakistan - 2	Tunisia - 1
Argentina - 2	Ecuador -2	Fiji -2	Papua New Guinea - 2	Turkey - 3
Brazil - 5	Egypt – 2	Ghana - 5	Peru -1	Uganda -1
Bulgaria -1	El Salvador - 3	Honduras -1	Philippines – 28	Uruguay - 5
Cambodia -2	Ethiopia - 5	India - 44	Rwanda- 3	Venezuela - 1
Cameroon -1	Kenya -2	Indonesia - 28	Senegal - 2	Vietnam - 1
Chile - 3	Liberia - 1	Iran - 1	Serbia - 1	Zimbabwe -1
China - 1	Malawi -3	Morocco -1	South Africa – 5	
Colombia - 2	Malaysia - 8	Mozambique -1	Sri Lanka – 2	
		Nepal - 1		

Table 2 – Distribution per countries of delegates who benefited from Solidarity Fund

Plenary and other major presentations:

Plenary lectures: 4
Plenary Panels: 2
Awardee Lectures: 3
Survey Reports: 4
Reports on ICMI Studies: 1
Other program elements:
Invited Lectures: 59
TSGs: 54. – TSG papers/posters in program: 2074
Discussion Groups: 30
Workshops: 70
National Presentations: 5
ICMI Affiliate Organization Sessions: 15

Now, I will briefly present how ICMI is organized, its main activities and its most recent achievements. Most information can be found on the ICMI website: <https://www.mathunion.org/icmi/>

ICMI AS AN ORGANIZATION

ICMI Executive Committee

The governing body of ICMI is an Executive Committee elected every 4 years by the country representatives during the General Assembly on the day preceding the opening of each ICME. See <https://www.mathunion.org/icmi/organization/icmi-organization> for more details.

The ICMI EC is composed of:

- A President
- A Secretary-General
- Two Vice-Presidents
- 5 members-at-large
- The IMU President (ex-officio)
- The IMU Secretary-General (ex-officio)
- The Preceding ICMI President (ex-officio)
- An IMU EC Liaison designated by the IMU EC (ex-officio)

The current ICMI EC elected during the 2020 GA is in charge from 1.1.2021 until 31.12.2024



Figure 3: ICMI EC – 2021-2024

During the GA held on July 7, 2024 in Sydney, a new EC was elected, with its term starting on 1.1.2025 and finishing on 31.12.2028:



Figure 4: ICMI EC – 2025-2028

But the core of ICMI is made by the Country Representatives (CR).

ICMI Country Representatives

Every IMU Country Member designates through its Adhering Organization one ICMI Country Representative. Some non IMU countries may have on specific conditions an ICMI CR.

Currently there are about 90 ICMI CR (see <https://www.mathunion.org/icmi/organisation/our-members/icmi-representatives>). The main official role of ICMI CR is to elect the ICMI EC during the GA. However, especially since COVID, we have tried to make ICMI CR more involved in the life of ICMI. In this sense, we have organized some online meetings and during the last GA we have organized some workshops in order to have them exchange ideas and find some common issues to be

tackled through ICMI. ICMI CR can also every 3 months publish some information on their countries in the ICMI Newsletter. Moreover, they are our privileged correspondents, in all our activities, especially when we have to designate members to IPC for ICME or ICMI Studies for instance.



Figure 5 – Group picture during the ICMI GA in Sydney – July 7, 2024.

One pillar of ICMI are the affiliate organizations.

ICMI Affiliate Organizations

In order to foster international collaboration and exchanges in mathematics education, the ICMI organizational outreach includes multi-national organizations with interest in mathematics education, each operating in ways consistent with the aims and values of the Commission.

The organizations affiliated to ICMI are independent from the Commission, being neither appointed by ICMI nor operating on behalf or under the control of ICMI, and they are self-financed. However, they collaborate with ICMI on specific activities, such as the ICMI Studies or components of the program of the ICME Congresses.

The ICMI Affiliate Organizations produce quadrennial reports to be presented to the General Assembly of ICMI, and a brief annual report on their activities for the ICMI annual report. Each Affiliate Organization holds separate meetings on a more or less regular basis.

Some of ICMI's Affiliate Organizations have a wide international audience with specific thematic interests related to mathematics education: there are currently 9 such thematic Affiliate Organizations. Others are based on a regional scope: there are currently 8 of such regional Affiliate Organizations.

They are listed below with their year of affiliation:

9 Thematic Affiliate organizations:

- PME: The International Group for the Psychology of Mathematics Education (1976)
- HPM: The International Study Group on the Relations between the History and Pedagogy of Mathematics (1976)
- IOWME: The International Organization of Women and Mathematics Education (1987)
- WFNMC: The World Federation of National Mathematics Competitions (1994)
- ICTMA: The International Study Group for Mathematical Modelling and Applications (2003)
- CIEAEM: International Commission for the Study and Improvement of Mathematics Teaching (2010)
- MCG: The International Group for Mathematical Creativity and Giftedness (2011)
- ISDDE: International Society for Design and Development in Education (2017)
- ISGEm: International Study Group on Ethnomathematics (2024)

8 Regional Affiliate Organizations:

- EARCOME: East Asia Regional Conferences in Mathematics Education (1998)
- EMF: Espace Mathématique Francophone / French-speaking Mathematics Space (2003)
- AFRICMA: African Mathematical Education Association (2005)
- CIAEM/ IACME: Comité interamericana de educación matemática / Inter- American Committee on Mathematical Education (2009)
- ERME: European Society for Research in Mathematics Education (2010)
- MERGA: Mathematics Education Research Group of Australasia (2011)
- ADiMA: Association des Didacticiens des Mathématiques Africains / Association of African Didacticians of Mathematics (2019)
- CIBEM: Congresso Iberoamericano de Educação Matemática / Iberoamerican Congress of Mathematics Education (2020)

One last important issue in ICMI as an organization are the different ways to communicate.

Communication

ICMI communicates through various media:

- The ICMI Newsletter, published every: March 15 – June 15 – September 15 – December 15
<https://www.mathunion.org/icmi/publications/icmi-newsletter>
- ICMI Website: <https://www.mathunion.org/icmi>
- ICMI Facebook page: <https://www.facebook.com/InternationalMathUnion>
- We also have regular official publications (change of EC, short version of ICMI Study discussion documents and reports after the Study Volume release) in *L'Enseignement Mathématique*
<https://ems.press/journals/lem>

- An ICMI Column in the European Mathematical Magazine <https://ems.press/journals/mag>

IMU Secretariat and ICMI Finances

Finally, thanks to IMU, ICMI benefits from the precious support of the IMU Secretariat hosted in Berlin by the Weierstrass Institute WIAS. ICMI also has a volunteer Curator of ICMI Archive.

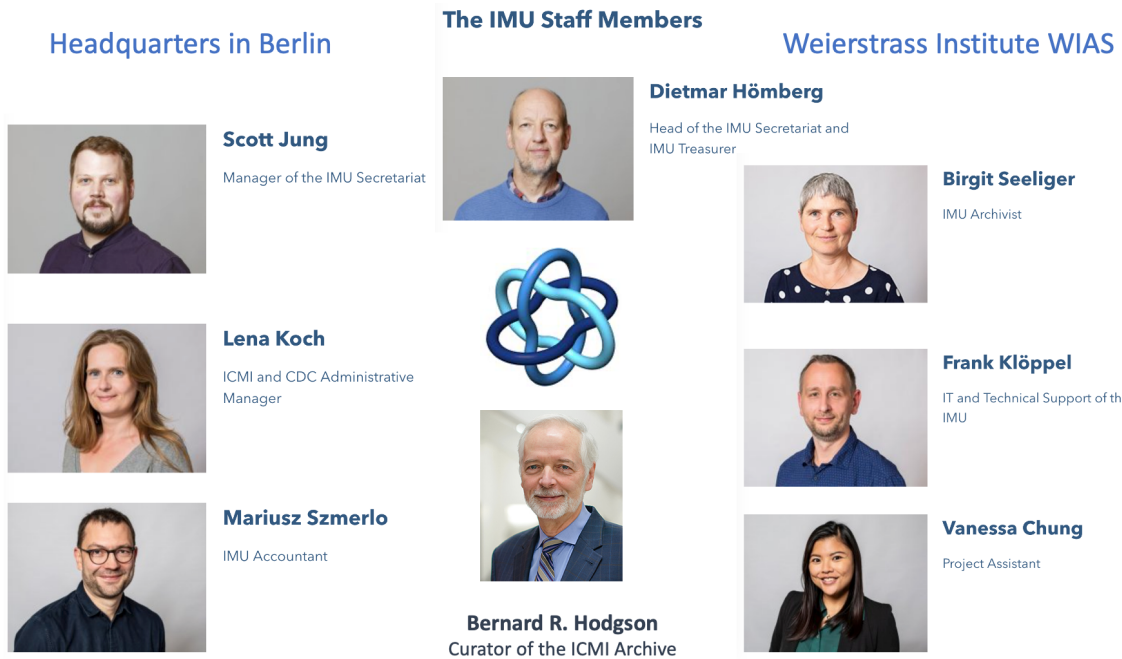


Figure 6 – IMU Secretariat and curator of ICMI Archive

ICMI has very little by way of financial resources; its main revenue is the annual grant from IMU.

In the past ICMI has obtained financial support from UNESCO and ICSU (now International Science Council) to help its actions towards developing countries.

Another key source of financial support for ICMI activities comes from academic institutions all over the world that support their faculty members to attend ICMI meetings and organize and often give financial support for various ICMI activities for example EC meetings, ICME and related costs, ICMI Studies IPC meetings and conferences, ICMI Regional Conferences, CANPs etc.). Furthermore, the EC members including the officers (President, Secretary-General and Vice-Presidents) are strictly volunteers. Some of their travelling expenses are supported by their universities or research grants, which is an indirect financial support to ICMI.

ICMI ACTIVITIES

Let us now present ICMI activities (other than ICME) and their latest achievements.

I will successively talk about:

- ICMI Studies
- CANP Projects
- ICMI Awards

- ICMI AMOR Project
- Klein Project
- Database Project
- International Day of Mathematics

ICMI Studies

The first ICMI Studies date from 1985 and were initiated under the presidency of Jean-Pierre Kahane, with A. Geoffrey Howson as Secretary-General. Each ICMI Study focuses on a topic or issue of prominent current interest in mathematics education. Built around an international conference, it is directed towards the preparation of a published volume intended to promote and assist discussion and action at the international, regional or institutional level.

First, the Executive Committee of ICMI decides upon a theme.

It then appoints two co-chairs and the International Program Committee (IPC), which on behalf of ICMI is responsible for conducting the Study. Usually, a country that is willing to host the corresponding ICMI Study Conference has been identified concurrently with the appointment of the IPC.

The first task of the IPC is to produce a Discussion Document in which a number of key issues and sub-themes related to the theme of the Study are identified and described in a preliminary manner. The Discussion Document is widely disseminated internationally to solicit contributions to the ICMI Study Conference.

From these submissions, invitations are issued to a limited number of participants (about 80) to participate in an international conference (ICMI Study Conference) constituting a working forum that investigates the theme of the study. Particular emphasis is given to bringing together to the Study conference both experts in the field and newcomers with interesting ideas or promising work in progress, as well as to gathering representatives with a variety of backgrounds from different regions, traditions and cultures.

Beyond the productive interaction and collaborations occasioned by the ICMI Study conference, its main product is a research volume, synthesizing the results of the conference and presenting a state-of-the-art expert report on the Study theme.

The final outcome of an ICMI Study is a Study Volume, appearing in the [New ICMI Studies Series](#) (NISS) under the general editorship of the President and the Secretary-General of ICMI and published by Springer. The ICMI Study volumes reflect the great variety of issues and concerns in the field of mathematics education and are of interest to educational researchers, curriculum developers, educational policy makers, teachers of mathematics, and to mathematicians and educators involved in the professional education and development of teachers of mathematics.

Since ICMI Study 23, ICMI policy is to have an open access publication. Moreover, we are trying to have all past volumes also available in open access. At the moment, the volumes of ICMI Studies 1-5, 19, 21-25 are open access.

ICMI Study 24 “School Mathematics Curriculum Reforms: Challenges, Changes and Opportunities” was published in 2023. https://link.springer.com/chapter/10.1007/978-3-031-13548-4_1

ICMI Study 25 “[Teachers of Mathematics Working and Learning in Collaborative Groups](#)” was published in June 2024.

ICMI Study 26 “Advances in Geometry Education” had its conference in Reims (France) in April 2024. The volume is expected in early 2026.



Figure 7 – ICMI Study 26 conference – Reims (France) – April 22-26, 2024

ICMI Study 27 “Mathematics Education and the Socio-Ecological” will have its conference in the Philippines (January 22-26, 2025). The volume is also expected in early 2026.



Figure 8 – Some examples of ICMI Study Volumes

Capacities and Networking Projects – CANP

CANP is a major development focus of the international bodies of mathematics educators and mathematicians (International Commission on Mathematical Instruction, ICMI and International Mathematical Union, IMU). CANP aims to develop the educational capacity of those responsible for

mathematics teachers, and create sustained and effective regional networks of teachers, mathematics educators and mathematicians, and linking them to international partners.

At the moment 5 CANP projects have launched in various part of the world; the figure below show their regional implant and the year they were launched.

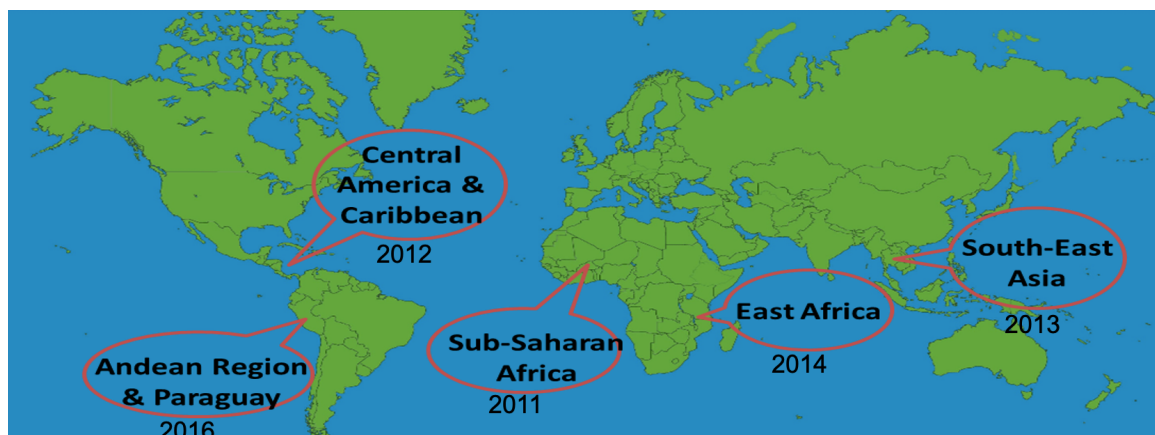


Figure 9 – The 5 CANP Projects

At the moment, there is no plan for a new CANP. We want to concentrate on the sustainability and reinforcement of the 5 existing projects, especially after the big challenge that the COVID-19 pandemic represented in all developing countries.

A workshop held in Bangkok in February 2024 was a good opportunity for leaders of the 5 CANPs to meet and share experiences.



Figure 10 – CANP Workshop – Bangkok (Thailand) Feb. 2024

ICMI Awards

The International Commission on Mathematical Instruction (ICMI) grants three prizes recognizing outstanding achievement in mathematics education which are awarded every four years at the Opening Ceremony of the International Congress on Mathematical Education (ICME).

The Felix Klein Award, named after the first president of ICMI (1908-1920), honors lifetime achievement.

The Hans Freudenthal Award, named after the eighth president of ICMI (1967-1970), recognizes a major cumulative program of research.

The Emma Castelnuovo Award, named after the Italian mathematics educator (1913-2014), recognizes outstanding achievements in the practice of mathematics education.

These three awards pay tribute to outstanding scholarship in mathematics education. They serve not only to encourage the efforts of others, but also to contribute to the development of high standards for the field through the public recognition of exemplars. The awards consist of a medal and a certificate, accompanied by a citation. They have a character similar to that of a university honorary degree.

At each International Congress on Mathematical Education (ICME), the awardees are announced and medals and certificates of the awards are presented at the Opening Ceremony. Furthermore, the awardees are invited to present special lectures (ICMI Award Lectures) at the Congress.

The ninth recipients of the Klein and Freudenthal Awards and the third recipient of the Emma Castelnuovo Award, were made public at the opening ceremony of ICME-15 in Sydney (Australia) on July 8, 2024

 <p>Ferdinando Arzarello, Professor Emeritus of the University of Turin, Italy receives the 2024 Felix Klein Award, in recognition of his more than forty years of sustained, consistent, and outstanding achievements in mathematics education research and development.</p>	 <p>Ole Skovsmose, Professor Emeritus of Aalborg University, Denmark receives the 2024 Hans Freudenthal Award, for his outstanding contributions to the very foundations of mathematics education through his career-long explorations of Critical Mathematics Education.</p>	 <p>Kaye Stacey, Professor Emeritus of the University of Melbourne, Australia receives the 2024 Emma Castelnuovo Award in recognition of her more than 40 years of research-based design, development and implementation of innovative, influential work in the practice of Mathematics Education</p>
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More information, including the list of all awardees and their citations, can be found at: <https://www.mathunion.org/icmi/awards/>

ICMI Awardees Multimedia Online Resources project – AMOR



The goal of this project is to build online resources reflecting highly significant and influential research in mathematics education at an international level. These resources could be a reference not only for researchers, but also for educators, teachers, curriculum developers and policy makers and other agents in the field. In particular, such a project could serve as a basis for a PhD training program and induction into mathematics education research.

This project was initiated by Jean-Luc Dorier as member of ICMI EC 2013-2019 under Ferdinando Arzarello's presidency, with Abraham Arcavi as Secretary-General.

It is now online on the ICMI website : <https://www.mathunion.org/icmi/awards/amor>.

The concept is that:

Each awardee has a unit

- A unit is made of several modules
- A module includes a short video of 10-30 minutes duration and some bibliographical items.
- Each unit starts with an introductory module (Module 0) presenting some biographical and scientific elements of the background of the awardee.
- All the videos are in English, as are most of the texts.
- Each unit comprises 8 to 12 modules with up to a total of 120-180 minutes of video material.
- Each module gives some keys to help reading some of the awardee's research papers which are given as much as possible as free access resources attached to each module. There is also a global selected bibliography of the awardee's work and of connected researchers.
- One module is basically a slide presentation with a speaker visible in a corner (sometimes full screen). The speaker can be, but is not necessarily, the awardee him/herself. There can also be variation from one module to the other or even within the same module.
- A range of additional multimedia, including films, animations can be used. No doubt new media formats will emerge over time.

At the moment, out of 10 Klein and 10 Freudenthal awardees and 3 Castelnuovo, 7 units are completed:

- Michèle Artigue (Klein 2013): 9 modules

- Guy Brousseau (Klein 2003): 11 Modules
- Yves Chevallard (Freudenthal 2009): 9 modules
- Ubiratan D'Ambrosio (Klein 2005): 10 modules
- Celia Hoyles (Freudenthal 2003): 3 modules +1 interview
- Terezinha Nunes (Freudenthal 2017): 4 modules
- Anna Sfard (Freudenthal 2007): 8 modules

Klein project

The Klein Project is an IMU/ICMI project that began in 2008, with the aim of producing mathematics resources for secondary teachers on contemporary mathematics. It was inspired by Felix Klein's book *Elementary Mathematics from a Higher Standpoint*, first published 100 years earlier. It is intended as a stimulus for mathematics teachers, so as to help them to make connections between the mathematics they teach, or can be asked to teach, and the field of mathematics, while taking into account the evolution of this field over the last century. A Design Group was established, and plans formed to produce "vignettes". A vignette is a short, readable piece on a topic of contemporary mathematics.

Vignettes are intended to give teachers a sense of connectedness between the mathematics of the teachers' world and contemporary research and applications in the mathematical sciences. Thus, it will start with something with which the teacher is familiar and move towards a greater understanding of the subject through a piece of interesting mathematics. It will ultimately illustrate a key principle of mathematics. The vignette must be written in a way to complete this journey.

See <https://www.mathunion.org/icmi/activities/klein-project/activities/klein-project> for more information.

Database Project

The ICMI Executive Committee decided in its February 2011 meeting to launch another major project, called the Database Project, whose ultimate goal is to build and update a database of the mathematics curricula all over the world.

For the first phase of this project, we asked all ICMI representatives to send us a link to the webpage(s) of their country where anybody can find the official mathematics curricula at all levels of instruction (pre-primary, primary, elementary, middle, secondary, vocational, etc.).

Now the database project covers about 30 countries.

International Day of Mathematics



The International Day of Mathematics (IDM) is a worldwide celebration. Each year on March 14 all countries are invited to participate through activities for both students and the general public in schools, museums, libraries and other spaces. The website of the IDM is: <https://www.idm314.org/>

The proclamation of March 14 as the International Day of Mathematics was adopted by the Executive Council of UNESCO at its 205th session. It was adopted by the 40th session of the General Conference of the UNESCO in November 2019. The inaugural celebration of the IDM took place on March 14, 2020. The theme for 2020 was Mathematics is Everywhere. An overview of the events and activities that took place within the scope of this theme can be found at: <https://everywhere.idm314.org/>. In 2021, the theme was Mathematics for a Better World. Mathematics Unites was the theme for 2022, while in 2023 the theme was Mathematics for Everyone. 2024 saw the IDM focus on the theme Playing with Math.

A new theme every year: Every year IMU will announce a new theme to flavor the celebration, spark creativity and bring light to connections between mathematics and all sorts of fields, concepts and ideas.

ICMI and all ICMI CR are involved in this beautiful project.

I hope that after reading these pages you have a better idea of what are both ICME and ICMI!