

ICMI

ICMI Newsletter

A Newsletter from the ICMI-International Commission
on Mathematical Instruction

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1. From the desk of Jill Adler, President of ICMI



As the outgoing President of ICMI this is my last communication with you in the ICMI newsletter. Together with my colleagues in the EC, we have overseen, consolidated and extended the work of our organization which provides a unique international forum for the study and improvement of mathematics education the world over, a space for reflection, exchange and collaboration, for the dissemination of ideas and results, to all those professionally concerned by mathematics education. It is indeed an extraordinary vision and it has been an honor and privilege to hold the position of President for the past four years.

I don't intend here to report on the progress made by the 2017 - 2020 Executive Committee (EC) towards our ambitious, multi-faceted vision. These have been covered over the four years, both through the newsletter and in my video recorded presentation to the ICMI General Assembly in July this year (see <https://www.mathunion.org/icmi/organization/icmi-organization>). What I do want to do is to reflect on the issues of growth and sustainability within ICMI, perhaps made more pressing in our COVID impacted world.

Our work in each of the five CANPs supported over the past four years exemplifies this concern. As an organization we have worked to enable them to consolidate and extend mathematics education activity in their regions, and connect this into ICMI. This is complex work and takes time. We know now how important it is that goals and activities towards the growth of new communities in ICMI need to be supported in the long term. New communities, particularly in low income countries, are growing and contributing to our global reach. And with such growth also comes fragility. Sustaining and expanding on the initiatives underway became our challenge. Support has been both financial (in line with a locally produced and thus regionally relevant three-

year plan) and professional (with a member of the EC a liaison working with each CANP). As we have interacted over the past months, each has reported on initiatives underway given current conditions and so changes to the initial plans. There have understandably been unforeseen obstacles, extending time frames and limiting goals. Our focus with CANP and then with all ICMI activities has been on understanding and enacting what it means to strengthen ICMI, its people, governance and key projects. Abraham Arcavi, Secretary General, talks about this too in his piece in this newsletter.

And this year, as the pandemic swept across the globe impacting all of our personal and professional lives, it simultaneously accelerated and magnified new opportunities and challenges. Social and economic inequities and the digital divide in education loom even larger both within and across countries. For ICMI, in this particular year, the greatest direct impact has been on our Congress, ICME-14. As an organization we thrive through collaborative activity. ICME has been the place for the cumulating knowledge and practice in our field to be showcased, shared, celebrated and collectively reflected on. In March, ICME-14 was postponed to July 2021, and under the leadership of the Congress Chair Jianpan Wang, our colleagues in China have continued to prepare towards a successful and productive Congress. They have all our support, and here I am sure I speak not only for the outgoing ICMI EC but also the incoming EC, and our international ICMI community at large. We appreciate the challenge of the work being done in all our interests, and in a context of continued uncertainty. We know that Professor Wang will soon communicate their further planning with the ICMI community through the ICME-14 website (www.icme14.org). ICMI will follow with communication on all ICMI channels.

The current ICMI EC has managed its final year of work despite the abrupt disruption to international travel. We adapted to and created new ways of working and report on our 'virtual' work in this newsletter. It is in this fluid context that I close by again thanking the EC for our collective accomplishments. I have had the privilege of learning from and forming friendships with wonderful people across the world. A very special thank you to Abraham who was in his second term as Secretary General as I become President. Abraham enabled a smooth and efficient transition between ECs. The insight, wisdom, humor and integrity he has brought to ICMI over the past eight years has been central to its growth.

Thank you too to Lena Koch whose support as part of the IMU Secretariat enables the ongoing and effective work of the EC; and to Carlos Kenig, Shigefumi Mori and Helge Holden - Presidents and Secretary General of the IMU - for their active and unwavering support.

To the incoming ICMI EC led by our new president Frederick Leung and Secretary General Jean-Luc Dorier, I offer my congratulations and well wishes. A phrase being used across global education organizations is that moving forward, we need to 'build back better'. I have no doubt that the new leadership of ICMI will find ways of building mathematics education for all and towards a better world.

2. Four more years - Merrilyn Goos, Vice President and Vice President Elect of ICMI.



An election marks a time when people get to make decisions ... about the future they want for their country or organization, the leaders whose policies and promises they find most attractive, and essentially whether they are satisfied with the way things are or instead wish for things to be different. The call for "four more years" is sometimes heard as encouragement for an incumbent leader to stand for election for another four-year term of office.

Why would anyone want to do that?

This is a question I pondered when I was encouraged to stand for a second four-year term as an ICMI Vice-President. The reasons why I agreed were much the same as those that applied when I was originally approached four years earlier: curiosity about mathematics education around the world, commitment to

collaboration between mathematics educators and mathematicians, and a desire to learn more about how ICMI works as an international organization. While I've learned a great deal in the last four years, like everyone else I've realized that a global pandemic changes everything. All that we can be reasonably sure of is that we're on the road to somewhere new and that we might not arrive for some time yet.

I'm also sure that my own "four more years" will be different from my first term as Vice-President. Our professional lives have changed, perhaps irrevocably. What does it mean, now, to do research in mathematics education, to teach mathematics, or to prepare future teachers of mathematics? Recently I participated in an international seminar (online, of course) that considered some of these questions. We spoke about our experiences of teaching mathematics or mathematics education to a wide range of adult learners – doctoral students, pre-service teachers, disadvantaged young people who had left school early, and adults in prison who are undertaking further education and training. The presenters shared ingenious ways of using free or low-cost technologies on handheld devices and described some important lessons they and their students had learned about perseverance, patience and flexibility. They were not simply reproducing old ways in the new online environment, but instead were finding new ways to engage students and teachers in learning and research in mathematics education. These experiences give me hope that, over the next four years, the world of mathematics education will continue to change in innovative directions, and that I will find new eyes through which to look at and understand this world.

3. From the desk of Abraham Arcavi, Secretary General of ICMI



On 31 December, 2020, I will conclude my second term as Secretary General of ICMI. The current issue of the ICMI Newsletter is thus the last one I am co-editing. It was an immense honor for me to serve eight consecutive years in this exceptional institution, the largest and the most influential devoted to mathematics education around the world.

I was an admirer of ICMI long before my first participation in an ICME in Budapest in 1988, and my admiration grew as I attended all the ICMEs (except one) ever since. Thus, I was elated (and a bit nervous as well) when the position of Secretary General was offered to me, stepping into the big shoes of my predecessors. However, it was only when I got to know ICMI from within that I really understood the scope of its activities, the amazing spirit of this institution and the wonderful people who contributed and continue to contribute throughout the years to make ICMI what it is.

"There is a time for everything, and a season for every activity under the heavens" (Ecclesiastes, 3:1). There is the time for pioneering and visionary initiatives (ICMI Studies, CANP, AMOR, and the Klein Project among others) and there is a time to maintain these initiatives and adjust them if needed, so that they keep running smoothly and effectively, preserving their original essence. In my two periods as Secretary General, I was mostly engaged with the latter, which, although a less exciting task than propelling a wonderful new idea out of nothing, still ensures that these ideas are rightly implemented on an ongoing basis in the spirit in which they were created. In order to help carry out these projects, I was extremely fortunate to work with extraordinary people. With two of them I had intensive day to day interactions, and I refer to Ferdinando Arzarello and Jill Adler, the two presidents with whom I served and from whom I learned so much through the dozen (sometimes even more!) daily emails and countless phone, WhatsApp, Skype and Zoom interactions. Their dedication to ICMI and the way they listened to ideas, led the institution and knew how to handle disagreement towards building consensus was an inspiration for me and a joy to have. These were professional and institutional relations, which very soon turned into personal friendships. From Mogens Niss, Bernard Hogdson and Jaime Carvalho da Silva I learned what being a Secretary General of ICMI is and can be – their expert advice, especially on sensitive issues, was invaluable. Hyman Bass, Michèle Artigue and Bill Barton, ICMI Past Presidents, were always there when ICMI needed them, providing a sense of family whose close bonds remain untouched regardless of the formal end of their terms in office. I enjoyed very much the interactions with IMU Presidents Ingrid Daubechies (who suggested and encouraged the production of MOOCs), Shigefumi Mori and Carlos

Kenig, IMU presidents who as lead officers in the “parent” institution, acted exactly as that: guiding and caring parents. Special thanks to Helge Holden, the IMU Secretary General, for his dedicated attention to detail and for always reminding us of the right way of doing things. Cheryl Praeger and Merrilyn Goos, co-editors of this Newsletter were always available (even with the shortest of notices) to ensure that the Newsletters were distributed on time – thank you for your care and dedication. To the members of the two Executive Committees with whom I worked, my gratitude and recognition for eight years of ongoing pleasant collaboration.

Lena Koch acted always as much more than an outstanding administrative manager, bringing the collective institutional memory to bear when needed, offering her wise, tactful and informed advice so that every decision or every plan would be as good and as timely as possible.

As ICMI Secretary General, I was fortunate to meet so many interesting colleagues from around the world, to be at the crossroads in which sensitive and potentially impactful decisions were to be made, and to learn so much about mathematics education around the world. I always tried to abide by the spirit of ICMI: inclusiveness, fairness, support for promising projects, for creative ideas and for emerging communities, building consensus and trying to contribute to sensible decisions. I am aware of and take full responsibility for those unavoidable mishaps as Secretary General, which I hope did not harm the normal functioning or the good name of the institution.

To my friend and colleague Jean-Luc Dorier (as well as to all the members of the incoming Executive Committee) I wish all the best, and if/when you think I can be of any help, I will be there for ICMI. Do not become intimidated or constrained by viruses or other regional or global threats, regardless of how damaging these may be, there are always ways to circumvent obstacles such that educational endeavors like that of ICMI never stop. These endeavors are our main hope for a better world.

4. Three virtual meetings for the first time ever. A brief report.

I. The ICMI General Assembly

As a commission of the International Mathematical Union (IMU), ICMI has two constituent bodies: the Executive Committee (EC) and the ICMI Representatives of the member states. Once every four years the two bodies meet at the ICMI General Assembly (GA) for one day, prior to the beginning of the International Congress on Mathematical Education (ICME). The GA is also attended by representatives of the ICMI Affiliated Organizations and other invited guests. A main component of the GA is the election of the ICMI EC, and only the Country Representatives have the right to vote. The slate of candidates is presented by the ICMI Nominating Committee, following established procedures (see

https://www.mathunion.org/fileadmin/IMU/EC/Procedures_ICMI_2006-31-12_2012-01.pdf)

Following the postponement of the ICME, it was decided to hold a one-hour virtual meeting of the GA and to carry out the election online. The meeting took place on July 13, at a mutually convenient time for all time zones (for some the time was not optimal). President Jill Adler summarized the work of ICMI in a video recorded address which is available at <https://www.mathunion.org/icmi/organization/icmi-organization>.

The participation of Country Representatives was the largest ever, 55 out of the 84 (some of those absent were unable to connect and excused themselves). The result of the online election is as follows:

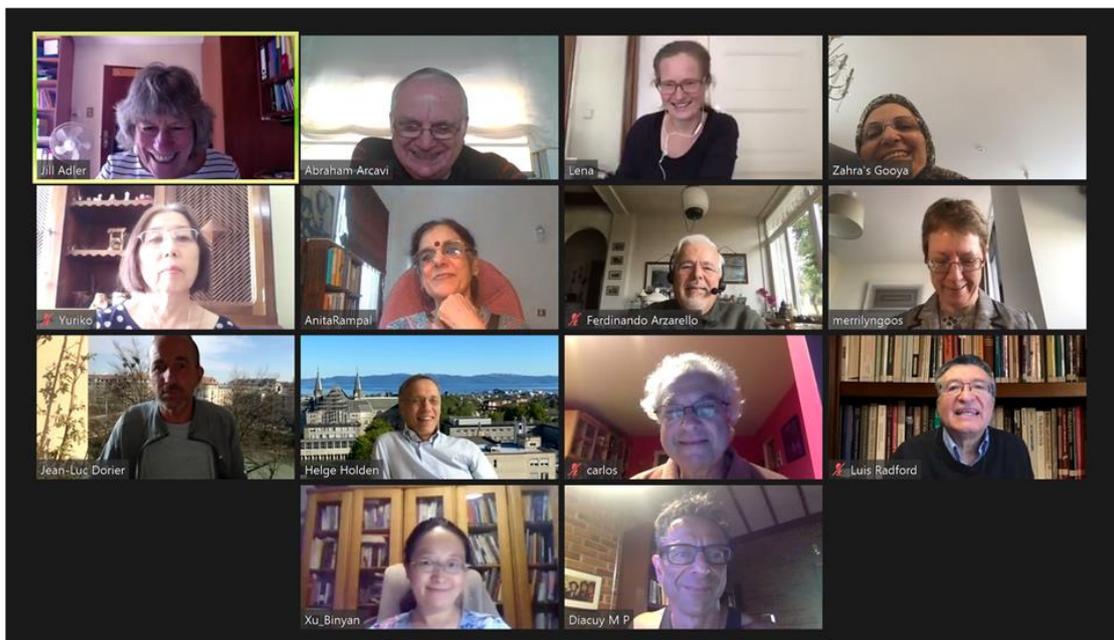
| | | |
|-----------------------------|----------------------|-----------------------|
| President | Frederic K. S. Leung | Hong Kong, SAR, China |
| Secretary-General | Jean-Luc Dorier, | Switzerland |
| Vice-Presidents (2) | Merrilyn Goos | Australia - Ireland |
| | Anjum Halai | Pakistan |
| Members-at-large (5) | | |
| | Marta Civil | USA |
| | Patricio Felmer | Chile |
| | Mercy Kazima | Malawi |
| | Nuria Planas | Spain |
| | Susanne Prediger | Germany |

A sequel to this GA meeting will be planned for July 2021, at ICME14.

II. The 4th meeting of the Executive Committee

The last meeting of the present Executive Committee was held online on September 9-11, 2020, spanning across 10 time zones. All of the members attended, and here are some of the decisions made:

- The Felix Klein, Hans Freudenthal and Emma Castelnuovo awards will be awarded once every four years at an ICME, effective January 2021. The calls for nominations were slightly modified in order to make more salient the differences between awards and to fine-tune the guidelines for submission.
- Jill Adler communicated the appointment of Professor Alan Schoenfeld (USA) as the incoming Chair of the Felix Klein and Hans Freudenthal Awards Committee and Professor Helen Forgasz (Australia) as the incoming chair of the Emma Castelnuovo Awards Committee. The names of the other committee members appointed remain undisclosed until their term is over.
- Upon the conclusion of the first phase of the evaluation of the ICMI Studies (see item 4 of the July 2020, ICMI Newsletter), a second phase will be launched.
- The final format of the ICME14 will be decided in November 2020 and communicated soon thereafter.
- The Klein Project and the ICMI archives will be funded to continue their excellent work.
- The International Program Committee for ICME15 in Australia in 2024 was selected and invitations were issued. Upon receipt of all the acceptance letters, the composition of the IPC will be made known.
- The following were approved as open access publications: ICMI Study 19 (*Proof and Proving in Mathematics Education*), ICMI Study 21 (*Mathematics Education and Language Diversity*) and ICMI Study 22 (*Task Design*). The contract with Springer is about to be signed.
- CIBEM (Congreso Ibero-Americano de Educación Matemática) was admitted as a new Regional Affiliated Organization (<https://www.pucsp.br/cibem2022>) and EMeLP was discontinued as an Affiliated Organization. Both organizations were notified of these decisions.



III. The handover meeting to the incoming Executive Committee.

On 28-29 October, the present executive officers (President, Vice Presidents and Secretary General) met with the incoming executive officers in order to ensure a smooth transition between ECs.

5. The History and Pedagogy of Mathematics Affiliated Organization: Comments from the Outgoing Chair Kathleen M. Clark.

Since July 2016, I have had the professional pleasure of serving as the Chair of the International Study Group on the Relations between the History and Pedagogy of Mathematics (or, the HPM Group). As an Associate Professor of Mathematics Education and Associate Director of the School of Teacher Education at Florida State University, my research for more than 15 years has been focused on research on multiple aspects of the HPM domain, including the role of history of mathematics on the teaching and learning of mathematics at all levels in mathematics education. Thus, it was an honor to serve the international HPM community at this particular point of my career.

During the last four years, HPM has continued to value its commitment to organizing and holding two international activities every four years. In July 2018, the Eighth European Summer University on the History and Epistemology in Mathematics Education (ESU-8) was held at Oslo Metropolitan University (OsloMet) in Oslo, Norway. Shortly thereafter, the HPM Group's Executive Committee and Advisory Board, along with the local organizing chair, Professor Xuhua Sun (University of Macau), began planning HPM 2020, which was to originally take place in July 2020 at the University of Macau. We do hope that this important activity can take place in July 2021, in a safe and an appropriate way, to bring together individuals with a keen interest in the relationship between the history of mathematics and mathematics education.

In the last four years, we have also continued to communicate the interests and activities of the HPM Group through our HPM Newsletter (3 issues per year; archived copies can be accessed from <http://www.clab.edc.uoc.gr/hpm/NewsLetters.htm>). We are particularly proud of Newsletter 100 (March 2019), in which we honored all past chairs of the HPM Group. Another key contribution of the HPM Group is the collection of proceedings from all quadrennial HPM meetings and the eight ESUs. Due to the efforts of Professor Costas Tzanakis and other former HPM Chairs, all of ESU proceedings (except for ESU-1) for the HPM satellite meetings can be accessed from <http://www.clab.edc.uoc.gr/hpm/about%20HPM.htm>.

Finally, in spring 2020 – amidst the global pandemic – the HPM Executive Committee and the HPM Advisory Board elected a new Chair, Professor Snezana Lawrence. Throughout her career, Snezana's scholarship has informed the work of others, advocated for integration of history of mathematics in mathematics teaching and learning, and provided fascinating perspectives from which to approach history in teaching, history in pre-service teacher education, and history in learning mathematics. We introduced Snezana to the HPM community in Newsletter 104 (July 2020), and she has already begun her tenure by selecting a new Executive Committee and expanding the HPM Advisory Board. The HPM Group's activities are in good (collective) hands, and I wish her an exciting and productive tenure as HPM Chair.

6. Once upon a time... Historical vignettes from the Archives of ICMI: A dilemma related to the ICMI Terms of reference. Bernard Hodgson, Curator of the ICMI Archive

I was recently approached by the ICMI Secretary-General, Abraham Arcavi, concerning an element of biographical information about the Italian mathematician, teacher and mathematics educator Emma Castelnuovo (1913-2014), after whom one of the ICMI Awards is named.

On the highly trustworthy website *MacTutor History of Mathematics Archive*, one can read that "The international role of Emma was acknowledged by her appointment as a 'member at large' in the Executive Committee of ICMI from 1975 to 1978." [1]

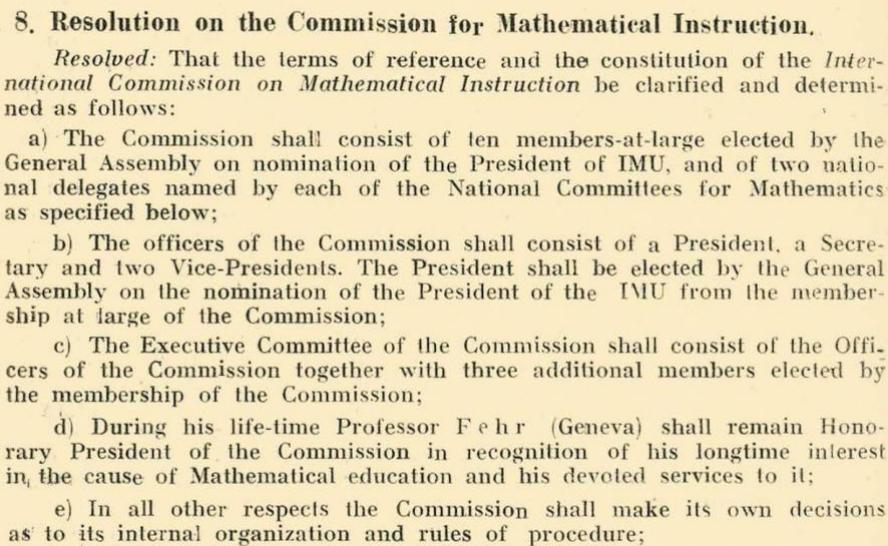
However, this statement is in conflict with the list of the members of the past ICMI Executive Committees as found on the ICMI website [2], where the name of Emma Castelnuovo does not appear. The ICMI SG was wondering how to deal with those two contradictory pieces of information. Was there an accidental omission on the ICMI website?

The resolution of this discordance relies on the examination of the various versions of the Terms of Reference adopted for ICMI over the years, since its rebirth in the early 1950s as a commission of the then newly established International Mathematical Union. (As a matter of fact, this mid-20th century episode was also a rebirth for IMU itself, as the Union is celebrating this year its centennial, on the basis of the foundation in 1920 of the now so-called 'Old IMU'. See [3] for more information.) The ICMI Terms of Reference have been through seven versions: 1954, 1960, 1982, 1986, 2002, 2007 and 2009 [4]. The variations from one version to the other are

at times important and dealing with essential issues, and at other times rather minor. Still they tell a lot about the evolution of ICMI as a commission of IMU.

I wish in this vignette to concentrate on one (double) aspect of these Terms: the notion of *membership in ICMI* and that of *membership in its Executive Committee*.

At the very first General Assembly of IMU, held in Rome in 1952, it was formally decided that the members of the Union would be countries [3, p. 98] (and not individuals), keeping in spirit with the practice of the IMU from the aftermath of WW1. The notion of 'ICMI membership' was addressed in the first version of the Terms of Reference for ICMI adopted two years later, as part of the resolutions of the second IMU General Assembly held in The Hague in 1954.

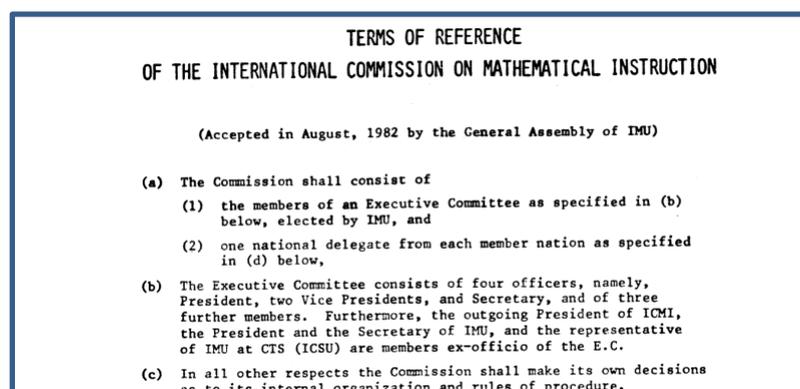


First version of the ICMI Terms of reference (1954) – items a) to e).

Internationale Mathematische Nachrichten 35/36 (November 1954) p. 12. (Source: IMU Archive)

The figure shows clauses a) to e) of these Terms (from a total of nine). The point to be stressed with respect to the Castelnuovo dilemma is under item a), where it is indicated the Commission (i.e., ICMI itself) consists of individuals, ten of whom, called 'members-at-large', are elected by the IMU General Assembly on nomination of the IMU President, to which are added two delegates per each country member of IMU. Also of interest is clause b), concerning the election by the IMU General Assembly of the ICMI President from the membership-at-large, as well as clause c), defining the Executive Committee of ICMI. A point to be noted is that the members-at-large of ICMI are not de facto members of the ICMI EC.

This state of affairs remained essentially unchanged up to the early 1980s – except for clause d), which was removed following the passing in November 1954 of ICMI founding Secretary-General, Henri Fehr. It is only with the 1982 revision of ICMI Terms of reference that the notion of member-at-large of ICMI disappeared from the Terms, the composition of the Commission then being made of the members of the Executive Committee plus one delegate from each IMU member country.



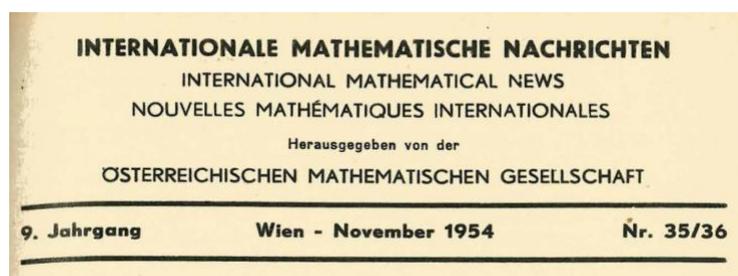
Third version of the ICMI Terms of reference (1982) – items a) to c).

ICMI Bulletin 13 (February 1983) p. 5. (Source: IMU Archive)

It is worth stressing that it is only with the 2002 revision of ICMI Terms of Reference that the membership of ICMI was redefined so to align with that of IMU, namely that ICMI members are countries, and not individuals. It is also on that occasion that the notion of 'ICMI General Assembly' was introduced within the Terms, the composition of this ICMI GA being based on item a) of the 1982 Terms. But it must be stressed that ICMI GAs, even though not formally mentioned in the Terms, had been regularly held for a long while, in particular on the occasion of the ICME congresses.

A lot could be added about other aspects in the evolution of the ICMI Terms of Reference, but these would be topics for other vignettes...

Back now to the confusion at the origin of the present paper: what about Emma Castelnuovo in all this? She was indeed elected by the 1974 IMU GA to serve as a member-at-large of ICMI (in the sense defined above) during the term of the 1975-1978 Executive Committee with Shokichi Iyanaga as President. But she did not serve as a member (nor a 'member-at-large') in the ICMI EC, in spite of what is mentioned in [1]. Her presence among the members-at-large of ICMI is mentioned for instance in a report on the election held at the 1974 IMU GA and published in the *ICMI Bulletin* [5]. Among the ten members-at-large there listed, four became members of the 1975-1978 EC: Edward Begle, Bent Christiansen, Shokichi Iyanaga and Lev Kudryatsev. For a full list of the 'members of ICMI' as of 1975, see [6].



Internationale Mathematische Nachrichten 35/36 (November 1954) p. 1.
(Source: IMU Archive)

I conclude this vignette with a word on the links between IMU and the journal *Internationale Mathematische Nachrichten* (IMN), the source of the figure above showing an excerpt from the 1954 ICMI Terms of Reference. Established in 1947 by the Austrian Mathematical Society (originally called 'Mathematical Society in Vienna', the name under which the first four issues of the journal were published), IMN has served for a long period as the main channel of communication for matters pertaining to mathematics as seen from an international perspective. It serves in particular today as a most precious source of information in relation to the creation of IMU after WW2 and about the first two decades of existence of the Union [3, p. 74]. It is only in 1971 that IMU started the publication of a regular bulletin on its own [3, p. 178]. All the IMN issues containing information related to the Union are readily accessible under the *IMU Bulletin* page on the IMU website.

Sources

- [1] "Emma Castelnuovo." *MacTutor History of Mathematics Archive*, University of St Andrews, Scotland. [mathshistory.st-andrews.ac.uk/Biographies/Castelnuovo_Emma/] (Accessed on October 14, 2020)
- [2] "Past ICMI Executive Committees." International Commission on Mathematical Instruction (ICMI). [www.mathunion.org/icmi/organisation/icmi-executive-committee/past-icmi-executive-committees] (Accessed on October 14, 2020)
- [3] Lehto, O. (1998). *Mathematics without borders: A history of the International Mathematical Union*. New York: Springer. [www.mathunion.org/organization/imu-history]
- [4] "ICMI as an organization / Terms of reference." International Commission on Mathematical Instruction (ICMI). [www.mathunion.org/icmi/organization/icmi-organization] (Accessed on October 14, 2020)
- [5] "Elections at the IMU General Assembly, 1974." *ICMI Bulletin* 4 (November 1974) p. 1.
- [6] "List of members of ICMI." *ICMI Bulletin* 5 (April 1975) p. 7-13.

7. International Mathematical Union (IMU) - News in brief.

- 2020 is the IMU centennial year. Celebrations were planned to take place in Strasbourg, where IMU was founded. The event has been postponed for a year until 2021 (<https://indico.math.cnrs.fr/event/5375/>).
- An ad hoc Committee on Diversity (CoD) was established to review the activities of the IMU in relation to diversity and inclusion of minorities and disadvantaged groups and offer advice on how to improve. Anjum Halai, incoming Vice-President of ICMI, is a member of the committee (more details can be found at <https://www.mathunion.org/activities/ad-hoc-committee-diversity-cod>). The committee will present its recommendations at the International Congress of Mathematicians (ICM) in 2022.
- The ICM will include the already traditional Panel 18 on Mathematics Education and Popularization of Mathematics.

8. ICME 16, 2028 - An event around the corner... Call for the intention to present a bid to host ICME 16

The fixed activities of any ICMI Executive Committee indicate that towards the end of an ICME year, a first call for organizing the ICME seven and a half years later should be issued.

The call is for the intention to present a bid to host an ICME, in this case the ICME 16 in 2028. The purpose of this call is to spark conversations within mathematics education communities about the feasibility of hosting the congress.

Countries considering submitting a bid to host ICME 16 should be aware of the following timetable:

- A preliminary declaration of intention of presenting a bid to act as host should be received by the Secretary General of ICMI by December 1st, 2021.
- Fully-fledged bids should reach the Secretary-General by November 1st, 2022 (in 12 copies).

The decision about the site of ICME 16 will be made by selecting one of the bidding countries and will be announced before the end of 2023.

This early call allows for a year to consider an intention to bid, and an extra year to consolidate the bid.

9. Upcoming Conferences

ICME-14: As we near the end of 2020, and preparations for ICME-14 in 2021 continue, we remind readers to regularly check the ICME-14 website (<https://www.icme14.org>) for information and communication about ICME-14 from the Congress Chair.

MERGA 43 conference will be held on the 5th – 9th July 2021. Due to the ongoing COVID-19 pandemic and the uncertainty that remains in relation to travel restrictions, this will be a virtual conference.

<http://math.nie.edu.sg/merga43/>

PME 44 Annual Conference will take place in Khon Kaen, Thailand, July 20-24, 2021

On the website of the conference you also find information about the virtual meeting held in July 2020.

<https://pme44.kku.ac.th/home/>

EMF 2021 will be held in Cotonou December 11 - 17 2021

<http://emf.unige.ch/emf2021/>

XVI CIAEM will be held in Lima, Perú, in July/ August 2023

<https://ciaem-iacme.org/xvi-ciaem-en-2023/>

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