

The IMU Committee for Women in Mathematics (CWM) and its first meeting

The IMU Committee for Women in Mathematics (CWM) was created by the IMU Executive in March 2015 and held its first meeting in the beautiful location of Cortona, Italy, September 4-5, 2015, immediately following the 17th General Meeting of European Women in Mathematics (EWM) which was held in the same location.

With few exceptions, all members of the new committee were able to come. Present were Carolina Araujo (IMPA, Rio de Janeiro); Bill Barton (Auckland); Sunsook Noh (Seoul); Marie Françoise Ouedraogo (Ouagadougou, Burkina Faso); Marie-Françoise Roy (Rennes; Chair); Caroline Series (Warwick; Vice-Chair) and Betül Tanbay (Istanbul). In addition, there were replacements for those who were not able to attend: Magnhild Lien (California State Univ. and AWM Executive Director) in place of Kristin Lauter (Microsoft and U. of Washington, current AWM President); Neela Nataraj (IIT Bombay) in place of Sujatha Ramdorai (University of British Columbia); and Alicia Dickenstein (Buenos Aires, IMU Vice-President) in place of John Toland (Director, Newton Institute, UK) as IMU EC liaison. Ari Laptev (London and Institut Mittag-Leffler, Sweden) was represented by Marie-Françoise Roy and Caroline Series. For the full remit of CWM and details of its members see Home/about on the CWM website www.mathunion.org/cwm

CWM website

The CWM website <http://www.mathunion.org/cwm/> is integral to our work. Launched in August 2014 by the IMU following an initiative of the then President Ingrid Daubechies, its aim is to provide an internationally based resource for women mathematicians. The website is a crucial means of communication and is now being kept updated and enriched by CWM. The web editor Caroline Series has been invited to take part in the forthcoming revision of the whole IMU website and we hope the result will be a more dynamic site which is easier to edit.

CWM Cortona meeting

The committee meeting took place over two days, allowing time for members to meet informally and exchange ideas outside the long formal sessions. Preparatory work had been done with a detailed agenda and preliminary Skype discussions, especially with those committee members not able to attend in person.

Reports from various parts of the world

Following introductions, we began with reports from the various parts of the world.

Africa

Of particular interest was the formation in 2013 of the African Women in Mathematics Association (AWMA), with Marie Françoise Ouedraogo as its President. AWMA held its first general meeting in June 2015 in Kenya, at the same time launching its new website africanwomeninmath.org. Based on the same model and with the same professional designer as the EWM site europeanwomeninmaths.org, this was achieved with advice and help from Marie-Françoise Roy and financial support from CWM. It was noted that following the same format as that of EWM saved much cost and time and the outcome has been very successful. In addition, a number of individual African countries (Congo, Ivory Coast, Kenya, Nigeria, Tunisia ...) have in the last two years formed their own organizations.

America and Europe

As reported by Magnhild Lien and Caroline Series respectively, the American and European organizations, Association for Women in Mathematics (AWM) and European Women in Mathematics (EWM), are long established with many activities; there is a wealth of information on their respective websites.

Founded in 1971, AWM has achieved recognition as a mainstream professional mathematical organization in the USA, having a good working relationships with AMS, NSF and so on. We congratulated AWM on the recent award of \$US 750,000 from the NSF for ‘advancement of women through research-focussed networks’. AWM has an active Facebook and Twitter presence with about 3500 followers and is enthusiastic about fostering more social media connections. This is a topic which the CWM should be considering further in future. AWM also has affiliated membership (e.g. with Korean Women in Mathematics Society), and a Developing Countries membership.

EWM has an email network, coordinators who serve as contacts in most European countries, and recently set up a Facebook page. It maintains contact with the European Maths Society through the EMS Women in Maths Committee of which Caroline Series is Chair. Individual countries sport a variety of different types of organizations, such as the membership organization *femmes et maths* in France and the LMS Women in Maths Committee in the UK. This EWM model could be useful for other parts of the world.

Asia

From Asia we had two reports, from Sunsook Noh and Neela Nataraj. In India, after ICWM 2010 in Hyderabad, there have been a number of recent events aimed at female mathematicians and Neela reported that an *Executive Committee for Women related activities in Mathematics* has just been formed. This committee hopes to organize a meeting in summer 2016; we await developments with interest and felt that this is exactly the type of activity which our committee can encourage and support. We noted that there is also a recently formed group in Pakistan.

Since ICWM 2014 in Seoul, there have been two major meetings for women in mathematics in South Korea, one in November 2014 in Seoul, and one in July 2015 in Daejeon. However there is no overarching Asian organization and it was agreed to establish a contact list and work towards a possible pan-Asian meeting in 2017.

Latin America

Carolina Araujo and Alicia Dickenstein told us that, apart from a few recent initiatives in Mexico and Chile, there is a lack of organization for women in mathematics in Latin America. However Carolina reported that some Brazilian women will be organizing the First Meeting of Women Mathematicians of the state of Sao Paulo in March 2016. We hope our committee can lend its support to this nascent group, possibly helping it to include delegates from other Latin American countries.

Middle East

Regarding Turkey and the Middle East, Betül Tanbay (current President of the Turkish Mathematical Society) gave a presentation on Mathematics in Turkey, including the Nesin Mathematical Village, where gender balance is achieved in the activities. We noted that there might be a possibility of some activity at the Caucasian Mathematics Conference, August 25-26, 2016, and that there is also some interest in organization from women in Saudi Arabia. We also noted - after Cortona- that the first Israeli meeting for Women in Mathematics took place this year August 2015 in Tel Aviv.

Oceania

Finally for Oceania, Bill Barton (former President and current member of the ICMI Executive) reported that there are two organized groups for women in mathematics in Australia: *Women in Mathematics Special Interest Group of Australian Mathematical Society* (WIMSIG) and *Choose Maths*, a five-year AUD 22 million national program that aims to turn around public perception of

mathematics and statistics as a career choice for girls and young women. WIMSIG has been especially active recently with travel awards, lectureship and a monthly newsletter; for more information about both organizations see the CWM website. In New Zealand, there are activities but no single organization. As far as we know, there are no women in mathematics activities in Pacific nations, despite both French and English-speaking pan-Pacific universities.

More details and links can be found on CWM webpage <http://www.mathunion.org/cwm/>

(WM)² : World Meeting for Women in Mathematics

The discussion then moved onto how to use the opportunity of the ICM in Rio in 2018 to further our remit. It will be very important to avoid the overlapping of activities with the ICM itself which was an unfortunate feature of ICWM 2014 in Seoul. After considerable discussion, aided by the fact that Carolina Araujo is on the local organising committee for the ICM 2018 in Rio, it was agreed that we should aim to organize a pre-ICM event for female mathematicians with a strong Latin American focus. The name *(WM)² : World Meeting for Women in Mathematics* was suggested. *(WM)²* would include a mix of academic activities (a plenary lecture and short presentations by Latin American women) and panel discussions about gender gap in the region. Given the current absence of an organization for women in mathematics in S. and Central America, we agreed this meeting should be an official a CWM initiative. A main focus should be on networking in the region, and a main aim will be to structure a Latin American network for women in mathematics to be launched at that meeting. As an established IMU Committee, we expect also to have a slot in ICM 2018 to report on our activities and possibly hold a social event, ideally on the day of the Emmy Noether lecture.

Creation of regional and continental networks

The committee then turned to possible actions and activities in relation to its remit. It was suggested that we focus on a few concrete objectives by Rio 2018, and that establishing networks of female mathematicians at the continental or subcontinental level would be important. We have a budget from the IMU of just under 20,000 euros per year and agreed a priority use would be to help the creation of such networks. It was decided that we will shortly launch a call for proposals for funding of up to 3000 euros to support actions which would further these aims, preferably on the 'regional' or 'continental' level. In particular, we envisage supporting the nascent organizations in India and Latin America in this way. Help could include funding initial meetings, travel for individuals for consultation purposes, or advice and support in creating websites along the line of that of AWMA. The call will be announced on the CWM website and advertised as widely as possible through suitable channels.

Other projects

Various other possible projects were discussed. Briefly, these were: to create a list of contact persons who could disseminate information in each of their regions; to launch a Gender Gap Index in Mathematics, to hold a CWM summer school in 2017, if possible with ICTP support and with a joint CWM-OWSD (Organisation for Women in Science in Developing countries) event.

Next meeting

Although the committee plans normally to work by electronic means, a number of its members will be present in Berlin in July 2016 for the European Congress and the ICMI Executive meeting and we agreed to hold a meeting there on July 19th for those members who can attend. Other members will be able to participate electronically.

Key ideas

Finally we note a few general remarks agreed on by the committee. It was pointed out that CWM is the only committee that considers the issues for women in mathematics at the world level so we

have an important role and responsibility. Change takes generations, and although the situation is gradually getting better, each piece of progress presents new challenges. Networking seems to be key for this change. We need to keep a critical eye on gender equality initiatives so that we are in a better position as to what to recommend for others. A starting point might be to invite instigators of such initiatives to provide evidence of the effectiveness and outcomes of their programmes.

Conclusion

We live in exciting times. Maryam Mirzakhani became the first woman to receive the Fields Medal at ICM 2014 in Seoul, and in the last two years, mathematical women in many more countries have come together to launch meetings and networks. As the only international Committee for Women in Mathematics, we believe CWM has a vital role to play and we are grateful to the IMU for giving us this platform and support.

Marie-Françoise Roy & Caroline Series

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