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## A WORD FROM...

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Mathematical Union's Committee for Women in Mathematics

*The opinions expressed here are not necessarily those of the Notices or the AMS.*



Photo courtesy of Université de Rennes 1.

### Building a Worldwide Community of Women Mathematicians

Women's History Month brings focus to the accomplishments of women and is celebrated in this issue of the *Notices of the AMS*. I am very grateful for the opportunity to share some information about the Committee for Women in Mathematics (CWM),<sup>1</sup> a recently established organization created by the International Mathematical Union (IMU) Executive Committee in 2015. We are a small committee of ten members—eight female and two male—with members from all parts of the world. On this occasion, I'd like to introduce AMS members to one of the main CWM initiatives.

#### A CWM initiative: the World Meeting for Women in Mathematics (WM)<sup>2</sup>

One of our main initiatives is the World Meeting for Women in Mathematics (WM)<sup>2</sup>, which I decided to focus on, rather than trying to give a complete overview of all our activities.

In many ways, (WM)<sup>2</sup> is a continuation of the two successful International Congresses of Women Mathematicians (ICWM) held in Hyderabad 2010 and Seoul 2014 on the occasion of the International Congress of Mathematicians (ICM). However, ICWM did not have a very clear status with respect to the ICM. Moreover, the wording of ICWM looked awkward to us as it seemed to say that ICWM was the congress of women, and that women were not fully part of the ICM.

During the first CWM meeting held in Cortona (Italy) in September 2015, which I organized with CWM vice-chair Caroline Series, we decided to create a new event, (WM)<sup>2</sup>. Our aim was to encourage women in mathematics from all over the world to meet every four years, and to participate fully in the ICM as well.

The plan was to create a regular satellite event of the ICM, taking place the day before the opening of the ICM in the same venue. The program would include a mathematical component, highlighting the diverse contributions by women in mathematics from the part of the world where the ICM was taking place. It would also include discussions on various aspects of the situation of women in mathematics worldwide, and the inauguration of exhibitions and films specially created for the occasion.

#### The first (WM)<sup>2</sup> and its consequences

The first (WM)<sup>2</sup> took place in Rio in 2018.<sup>2</sup> The scientific committee, chaired by Georgia Benkart, selected a keynote lecturer (Monique Laurent), a public lecturer (Maria Esteban) and three invited lecturers from Latin America—Alicia Dickenstein (Argentina), Salome Martinez (Chile), and Maria Eulalia Vares (Brazil). The program also included group discussions, posters (both mathematical and on women in mathematics), the world premiere of the film *Journeys of Women in Mathematics*, and a tribute to Maryam Mirzakhani, who passed away on July 14, 2017.

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<sup>1</sup><https://www.mathunion.org/cwm>

<sup>2</sup><https://2018.worldwomeninmaths.org/>

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The *Remember Maryam Mirzakhani* Exhibition<sup>3</sup> created by Thaís Jordão (curator) and Rafael Meireles Barroso (designer), consisting of 18 original posters, was inaugurated at (WM)<sup>2</sup>, remained open during the ICM 2018, and has been shown in dozens of venues, including in Iran, since then.

The short film *Journeys of Women in Mathematics*<sup>4</sup> was created by CWM thanks to the support of the Simons Foundation. The focus of the film is the diversity and common passion of women mathematicians worldwide. The first part of the film, premiered at (WM)<sup>2</sup>, presented three women active in organizing regional and transnational networks: Carolina Araujo (Rio), a CWM member, the (WM)<sup>2</sup> main organizer, and also an ICM lecturer and member of the local ICM organising committee; Neela Nataraj (Mumbai), CWM associate and active member of Indian Women in Mathematics; and Amina Pecha (Yaounde, Cameroon), the founding chair of the Cameroon Women in Mathematics Association. All three were interviewed in their home countries, and attended (WM)<sup>2</sup>. They appear together in the final version of the film which gives a lively presentation of the atmosphere at (WM)<sup>2</sup> and features interviews of six women in mathematics from Latin America: including the three invited lecturers as well as Natalia Garcia (Mexico), Jaqueline Godoy Mesquita (Brazil), and Carolina Neira Jiménez (Colombia).

The (WM)<sup>2</sup> 2018 was a wonderful event and gathered around 350 participants, mostly women, from 51 different countries. Many of them were coming from developing countries, thanks to the support of the OpenArms program, with free registration offered by CWM. Twenty Brazilian Black women mathematicians received special support by Serrapilheira (a Brazilian private funding agency) and participated actively in (WM)<sup>2</sup> and the ICM.<sup>5</sup> They started a group, *Matemáticas Negras*, which has remained active since.<sup>6</sup>

The book *World Women in Mathematics 2018: Proceedings of the First World Meeting for Women in Mathematics—(WM)<sup>2</sup>* was published at the end of 2019 as a special volume of the AWM Springer Series, dedicated to the memory of Maryam Mirzakhani.<sup>7</sup>

### The May 12 initiative

During the (WM)<sup>2</sup> 2018, Ashraf Daneshkhan, on behalf of the Women's Committee of the Iranian Mathematical Society, proposed that May 12, the birthday of Maryam Mirzakhani, become a celebration day for women in mathematics. This proposal was approved by the participants of (WM)<sup>2</sup>, giving rise to the "May 12 Initiative," led by several organizations for women in mathematics worldwide (European Women in Mathematics, Association for Women in Mathematics, African Women in Mathematics Association, CGD-UMALCA the UMALCA's Gender and Diversity committee, Indian Women in Mathematics, and the Women's Committee of the Iranian Mathematical Society). At the same time, the IMU was involved in an international campaign to have March 14 (Pi day) recognized as International Day of Mathematics by UNESCO, and there was concern that another international initiative involving the IMU would create confusion. For this reason, CWM was not directly involved in the establishment of the May 12 initiative, even though I, and several other CWM members, have been active in the coordination group of May 12 on an individual basis.

The call for action sparked an overwhelming response, resulting in more than 100 events being organized in its inaugural year 2019, showing that the initiative fulfils a strong need.<sup>8</sup>

In 2020, because of the Covid pandemic, the main activity was individual screenings of the one-hour documentary film *Secrets of the Surface, the Mathematical Vision of Maryam Mirzakhani*, organized through an agreement between Zala Films and the May 12 initiative. More than 20,000 requests were received from 131 different countries.<sup>9</sup>

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<sup>3</sup><https://www.mathunion.org/cwm/cwm-initiatives/remember-maryam-mirzakhani>

<sup>4</sup>The 20 minute film can be found at <https://www.youtube.com/watch?v=uNj7riiPHOY>, with nearly 9000 views. The film is also posted on IMAGINARY's platform: <https://imaginary.org/fr/node/1491>. It is also directly available on the CWM website: <https://www.mathunion.org/cwm/cwm-initiatives/journeys-women-mathematics>.

<sup>5</sup>See the documentary *Potência Negra* (in Portuguese): <https://www.youtube.com/watch?v=untetrh5MyM>.

<sup>6</sup>See their anti-racism manifesto on CWM News: <https://www.mathunion.org/cwm/news-and-events/2020-06-14/brazilian-group-black-women-mathematicians-anti-racism-manifesto>, including contact email and instagram info.

<sup>7</sup>The complete report of (WM)<sup>2</sup> 2018 can be found here: [https://www.mathunion.org/fileadmin/CWM/Initiatives/short\\_report\\_wm2.pdf](https://www.mathunion.org/fileadmin/CWM/Initiatives/short_report_wm2.pdf).

<sup>8</sup>"May 12: Celebrating Women in Mathematics—From One Idea to One Hundred Events," published in *Notices of the AMS*, Volume 66, Number 11, 2019.

<sup>9</sup>For more information on May 12, in particular the 2021 and 2022 campaign, see <https://may12.womeninmaths.org/>.



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## The second (WM)<sup>2</sup> and the changes it went through

The second (WM)<sup>2</sup> was originally planned to take place in St Petersburg on July 5, 2022, the day between the IMU General Assembly and the opening of the ICM.<sup>10</sup> Approved as an official satellite conference by the ICM Local Organizing Committee (LOC), it was granted significant funding, together with meeting rooms (at the ExpoForum where the ICM was planned), and technical and logistical assistance. We also had an exhibition project *МАТЕМАТИКА, through a land of mathematics* based on ten interviews with women in mathematics across Russia, led by Olga Paris-Romaskevich. These heroines were researchers, administrators, teachers, with some of them involved in the mathematical olympiad movement. The goal was to sketch a portrait of modern Russian mathematics, through a series of personal stories.<sup>11</sup>

This project was prepared especially for the (WM)<sup>2</sup> and the exhibition was planned to be inaugurated at the meeting. Funding was available from the ICM LOC for the exhibition space, printing, and setting up of the exhibition, which was to remain open during the ICM 2022.

Following the war of Russia against Ukraine, which started on February 24, 2022, and the IMU's decision to transform ICM 2022 into a virtual event, vICM, with no connection with Russia, (WM)<sup>2</sup> had to be entirely redesigned. The preparation of the exhibition *МАТЕМАТИКА, through a land of mathematics*, was paused, since its authors did not feel that it could be continued to be prepared in the same spirit as before, indeed presenting joyful stories about Russian mathematics seemed totally out of place at this time.<sup>12</sup>

The date of (WM)<sup>2</sup> was modified to accommodate the rescheduled Ceremony for the IMU Prizes on July 5, 2022. The second (WM)<sup>2</sup> became a mostly virtual event taking place on July 1–2, 2022.

The first session of (WM)<sup>2</sup> 2022 was entirely virtual and took place on July 1, 2022.<sup>13</sup> The first part of the program featured four plenary online lectures by distinguished female mathematicians, selected in 2021 by the scientific committee chaired by CWM member Cheryl Praeger, and presented in the following order: Maryna Viazovska, Natalia Maslova, Mina Aganagic, and Eugenia Malinnikova. In the second part, the panel discussion "Girls and Mathematics: reflections and initiatives" took place with six panelists from all continents. It was devoted to the memory of Yulia Zdanovska. Yulia was a silver medalist at the European Girls' Mathematical Olympiads (EGMO) in 2017, a brilliant young mathematician with a successful future ahead of her. The young woman refused to leave Ukraine amid the war and, working as a volunteer, died in a fire caused by a Russian missile that hit her residential area in the eastern city of Kharkiv. She was 21 years old.

The ICM LOC had made plans to celebrate the 100th birthday of Olga Alexandrovna Ladyzhenskaya (OAL) and establish the OAL Medal in Mathematical Physics, to be awarded without any age or gender restriction. All of these plans collapsed when the war started. Several people worked very hard with CWM to rescue the beautiful idea of celebrating OAL in 2022 and inaugurating a prize named after a woman. The Simons Foundation agreed to fund the prize. Finally, the program of (WM)<sup>2</sup> on July 2, 2022 was a session organized jointly with the Probability and Mathematical Physics ICM satellite in Helsinki: the OAL Celebration, both live and broadcast.<sup>14</sup>

The program included the world premiere of a film about Olga Alexandrovna Ladyzhenskaya by Ekaterina Eremenko, and the inaugural awarding of the OAL Prize. The presentation of the prize was made by former IMU President Ingrid Daubechies, through a video, and the name the prize winner, Svetlana Jitomirskaya, was announced in a short film. As Ingrid explained, it was a wonderful coincidence that the inaugural OAL Prize, named after a great woman mathematician from Russia was awarded to a woman born in Ukraine, given that the selection process was finished before the war started. The laudatio was given by Artur Avila, while Svetlana's lecture was recorded and became her plenary lecture at the vICM, and the closing vICM lecture.

The remaining activities originally planned for (WM)<sup>2</sup> 2022, the poster session and the group discussions, were unfortunately cancelled, as was the exhibition *МАТЕМАТИКА, through a land of mathematics*.

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<sup>10</sup><https://2022.worldwomeninmaths.org/>

<sup>11</sup>See the webpage of the project here: <https://matematika.mathematiquesvagabondes.fr/about/>.

<sup>12</sup>See the text of the authors: <https://matematika.mathematiquesvagabondes.fr/>.

<sup>13</sup>See the record here: <https://www.youtube.com/watch?v=CQH5op3T2Z0>.

<sup>14</sup>See the record here: <https://www.youtube.com/watch?v=I-791hw1D5Q&t=7s>.

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In spite of the difficult context,  $(WM)^2$  was a very successful event. About 1100 people registered for  $(WM)^2$  from more than 100 countries. There are plans to publish another proceedings book as a special volume of the AWM Springer Series.

I attended the IMU award ceremony in Helsinki with CWM vice-chair Carolina Araujo on July 5, and we were deeply moved when the Fields Medal was awarded to Maryna Viazovska from Ukraine, who happened to be the first  $(WM)^2$  2022 plenary speaker.

#### [The third \$\(WM\)^2\$ in 2026 in Philadelphia \(USA\)?](#)

CWM hopes to organize the World Meeting for Women in Mathematics— $(WM)^2$ —on July 21, 2026, at the Pennsylvania Convention Center, with the full support and logistical help from the LOC of ICM 2026, similar to what was done/planned in 2018/2022 (before the war changed the plans). Preliminary positive contacts have been made with the ICM Organizing Committee.

Reaching gender equality in mathematics all over the world will take tremendous effort, and a lot of time. Working together to support the international community of women in mathematics, we can accelerate this transformation. I hope that the World Meeting for Women in Mathematics will remain instrumental in moving forward the network of women in mathematics all over the world.