Committee for Women in Mathematics

Report on activities funded by CWM in 2017

Summary

The International Mathematical Union Committee for Women in Mathematics invited proposals for funding for activities or initiatives taking place in 2017, aimed at either:

a) Establishing or supporting networks for women in mathematics, preferably at the continental or regional level, and with priority given to networks in developing or emerging countries.

b) Organizing a mathematical school open to all, with all women speakers and mainly women organisers.

c) Other ideas for researching and/or addressing issues encountered by women in mathematics may also be considered.

CWM received 50 applications and of which it supported 12. The events took place in Brazil, Canada (round table "*Women in Mathematics in the Americas*" during the Mathematical Congress of the Americas 2017), Chile, India, Iran, Japan, Mexico, Morocco, Nepal, Tunisia, South Africa and Vietnam (see Part I of the report). Most of these activities were devoted to creating or reinforcing regional or continental networks, while two were mathematical schools led by women and one was a math festival.

In total, there were about 960 participants, among them about 675 women.

Finally, CWM supported Gabriela Araujo Pardo (UNAM, Mexico) to attend the AWM Symposium in Los Angeles (April 2017) where she gave a well-appreciated short presentation of CWM (see Part II of the report).

<div align="right">Marie-Fançoise Roy and Neela Nataraj</div>

Part I : CWM funded activity reports 2017

1 Brazil Series of round tables in Brazil
Matemática: substantivo feminino
Challenges and perspectives on the gender issue

Partial Report July 2017 to December 2017

Our series of round tables started officially on the 2nd August 2017 with a round table at IMPA (Instituto de Matemática Pura e Aplicada, Rio de Janeiro) and another three round tables occurred during the semester. We describe each of them in detail in the next sections.

The series has been officially registered as part of the so-called "Biennium of Mathematics 2017-2018" in Brazil, which has the IMO 2017 and ICM 2018 as main events and "expresses the country's determination to devote time and resources to improve the public awareness of mathematics, at all levels", in the words of Marcelo Viana, Chair of the ICM 2018 Organizing Committee.

Also, most of the round tables were included as part of the program of some local scientific event. These two facts brought larger attention to the series and to each of the round tables.

Another eight round tables are planned for the period March-June 2018, with CWM 2017 funding.

IMPA, 02 August 2017 The opening of our series of round tables occurred at IMPA (Rio de Janeiro) during the Colóquio Brasileiro de Matemática, which is the most comprehensive scientific meeting of the Brazilian mathematical community and counts with the participation of many undergraduate and graduate students from all over the country, as well as great Brazilian and foreign researchers. This edition was particularly important for also being part of the "Biennium of Mathematics 2017-2018" in Brazil.

The audience of the debate was quite varied and included undergraduate and graduate students - both female and male - from all over Brazil, as well 1as professors and researchers (with smaller proportion of male colleagues among older generations). Also, part of the current board of directors of the Brazilian Mathematical Society was present: they reported to be impressed with the numbers brought by the panelists and mostly with the testimonials and the significance of the gender issue in the audience; they informally compromised to address it institutionally.

• Local organizer : Carolina Araujo

• Invited panelists : Márcia Barbosa (Physics, UFRGS), Maria Eulália Vares (Math, UFRJ)

Video of the meeting : https://www.youtube.com/watch?v=S4IUJmeYy2g

UFRPE, 18 October 2017 This roundtable was not initially planned and emerged from the initiative of the local organizers, after taking notice about the existence of our project, due to the visibility attained through the opening session at IMPA. It was part of the XIII Semana de Matemática da Universidade Federal Rural de Pernambuco, a local event proposed by

students and professors of the under- graduate course in Mathematics which constitutes an important opportunity for the interaction between present and future Math teachers in the State of Pernambuco.

The local organizers considered it an important starting point for the discussion of the gender issue, not only within their department, but including neighboring institutions, as it attracted audience from other universities.

• Local organizers: Karla Ferreira de Arruda Duque; Maité Kulesza

• Invited panelists: Karla Ferreira de Arruda Duque (Math, UFRPE); Maité Kulesza (Math, UFRPE); Maria Helena Lira (Education, UFRPE); Renata Vila Nova (World March of Women)

UFRN, 20 October 2017 The roundtable at the Universidade Federal do Rio Grande do Norte had the theme "For how long does she stand?", in allusion to a pool that the male colleagues of one of the panelists made to try to guess for how long she would hold in the Math course. The speakers also brought interesting quantitative information about women in Math in Brazil along the career and discussed the subject from the broader perspective of the gender issue in the society. Two interesting proposals for addressing the problem locally were elaborated: the coordinators of the undergraduate courses in Mathematics will be oriented to choosing female professors for key basic courses, so that the female students can have some contact from the beginning with well succeeded female mathematicians and they will start a systematic discussion of the theme with professors and students, stressing that some sexists behaviors are not admissible and provide legal support for those students who decide to denounce colleagues or professors for inadequate behavior regarding gender issues.

Local organizers reported that there were around 25 attendees, most of them women.

• Local organizers: Elaine Pimentel, Juliana Marta

• Invited panelists : Clesia Nunes (Math student, UFRN), Débora Borges Ferreira (Math, UFRN), Renata de Freitas (Math, UFF), Telma Gurgel (UERN)

Video of the meeting : https://youtu.be/wRNgOSXT7ys

UFAM, 27 October 2017 This roundtable integrated the program of the Semana de Arte, Ciênciae Tecnologia da Universidade Federal do Amazonas, which had the theme "Mathematics is everywhere: integrate to construct". It was preceded by the 3talk "Women in STEM - why so few?" given by Márcia Barbosa and both activities were attended by around 80 people. The local organizers consider this initiative as an important starting point for the discussion about women in Mathematics, as it made it clear that the difficulties and prejudices faced by women, from "jokes" to harassment, are much more frequent than it appeared to be before discussing them.

• Local organizers :Flávia Jacinto, Inês Padilha, Juliana Miranda

• Invited panelists: Marcia Cristina Bernardes Barbosa (Physics, UFRGS), Karla Christina Tribuzy Bandeira (Math, UFAM)

Final considerations

The series of round tables is being very successful so far, particularly in what concerns two of its main objectives: to bring visibility to the gender issue in Mathematics, taking the discussion to all Brazilian regions, pursuing the awareness of our community; and to identify the main problems faced by women in Mathematics and their causes, and to formulate and analyze proposals of actions to confront them.

We initially faced some difficulty in getting the interest of more than a single institution in the Northeast Region to organize a round table, but the visibility attained by the series motivated a group from UFRPE, so that two of the four round tables we already had were in this region. Due to practical difficulties, the first half of our series had less round tables than we expected (some were postponed), but another eight round tables are planned for the period March-June 2018. Also, many other gender-related events occurred, not officially part of our series, but within the process of awareness promoted by it.

The interaction between the coordinating team, the local organizers, the invited panelists and the audience of the twelve round tables is leading, as expected, to an organization of women mathematicians in Brazil. Its organic character is effective in a large and diverse country as Brazil and is directing the discussions more to the local level, as exemplify the propositions which emerged from the round table at UFRN. Nevertheless, colleagues in power positions are realizing the importance of tackling the gender issue in Mathematics within Brazil and this might lead to discussions and formulation of policies in the national level, as indicate the informal commitment of members of the board of directors of the Brazilian Mathematical Society (SBM) and the contact made by the board of directors of the Brazilian Society of Applied and Computational Society (SBMAC) with the coordinating team.

Finally, let us point two challenges for the second half of our series. Due to the diversity of the Brazilian mathematical community, also in the terms of organizational structure, we are facing some difficulty to organize quantitative data and collect them in a comprehensive, interesting and useful way.

We expect the next round tables to give us some insight in this direction and before the (WM)^2 meeting in 2018. The second challenge is to bring our male colleagues into the discussion. Most of the attendees of our round tables are female and it is particularly hard to make colleagues in higher levels of the career, even those who recognize the importance of the subject, to come to the discussions.

Further practical details can be found on our website: https://matematicasf.wordpress.com/

<div align="right">Report by Christina Brech</div>

2 Canada: Women in Mathematics panel, at the Mathematical Congress of the Americas 2017, 27 July 2017.

The event was organized by **Committee for gender and equality of the Mexican Mathematical Society, Women in Mathematics in Chile Collective, with support of the CWM of the Canadian Mathematical Society.** The panel consisted of two presentations on the causes of underrepresentation of women in academic mathematics, followed by a Question and Answers Session.

The topics of the presentations were:

- **Creating Inclusive Mathematics: Strategies for Addressing Bias & Barriers** by Dr. Heather Metcalf.

- **Beliefs about brilliance and women's underrepresentation in mathematics and beyond** by Dr. Andrei Cimpian.

The panel was attended by approximately 110 people which somewhat exceeded the capacity of the venue.

The panel was very well received among attendants. A lot of positive feedback as of the originality of the content was received. More precisely, several participants remarked that they liked that for once the cause of underrepresentation isn't found on women's lack of ambition or assertiveness among others, but rather on institutional and individual structures and biases which slow down or stop altogether women's career progression.

As a result of this panel, a similar event is being organized in the first meeting of the Mexican and Colombian Mathematical Societies in June 2018. The panel will feature a presentation by Dr. Sara Hottinger who is a specialist on Women Studies with a particular emphasis of the subject of Women in Math.

After organizing several events in which we provide a forum for professional mathematicians to listen to and interact with experts in bias and inclusion of women in STEM, it is our belief that this events move forward the discussion of the issue (as opposed to panels of women mathematicians), and are a great complement to actions for the visibility of women mathematicians.

Report by Natalia Garcia-Colin

3. Chile: II Encuentro de Mujeres Matematicas de America Latina, 22-26 January 2018.

The conference was held in Valdivia, Chile. The morning activities (9:30 am - 1:00 pm) took place at the *Centro de Estudios Cientificos (CECS),* and the afternoon sessions (3:00 pm-6:30 pm) in the Auditorium Hugo Campos of the *Universidad Austral de Chile (UACH).*

There were 89 participants **(86 women)** from the following countries: Chile (52%), Argentina (18%), Mexico (7%) and the rest from Peru, Bolivia, Uruguay, Brasil, Ecuador, Colombia, Cuba and Nicaragua.

The academic activities were the following:

1. **4 one-hour plenary talks** about mathematics. The plenary speakers were María Ofelia Ronco (Universidad de Talca, Chile), Alicia Dickenstein (Universidad de Buenos Aires, Argentina), Adriana Piazza (Universidad Adolfo Ibáñez, Chile), and Carolina Araujo (Instituto de Matematica Pura e Aplicada, Brasil). In addition to present their work on mathematics, each plenary speaker gave a small speech about her career.

2. **16 one half hour talks about mathematics.** All the speakers were female mathematicians working in Latin America.

3. **26 poster** presentations. *Tuesday from 4:45 pm.* Students and postdocs presented posters about their research in mathematics.

4. An exposition aimed to **popularization of sciences for general audiences.** Mónica Canales presented on Wednesday afternoon the exhibition *Mathematics illuminations*.

The activities about women and mathematics were the following:

1. **7 one-hour talks about gender and science**: gender gap in mathematics, feminism and science, masculinity and academia, etc (see the annexe for the details).

2. **1 Round table** about *Women in masculinized environments. Wednesday 6:00 pm.* Panelists: Carolina Hamodi (Universidad de Valladolid, Spain), Lilliam Alvarez (Cuban National Academy of Science, Cuba), Debbie Guerra (Universidad Austral de Chile, CHILE). This activity was aimed to general audience and approximately 100 persons attended the round table.

3. **Workshop about Gender Theory**. Antonieta Vera, Centre of Gender Studies of Universidad de Chile (CEGECAL), CHILE. *Monday 4:15-6:00 pm*. This activity was targeted to all participants of the conference. Basic concepts about Gender Theory were discussed, in particular, the concept of *exceptional women* to refer to women which challenge traditional femininity (as women in mathematics).

4. **Workshop about Negotiation Skills**. Lucia Schwember, General Manager BuBer Ltda, CoMarka Consultores, Universidad de Chile, CHILE. Wednesday 2:30-6:00 pm. This activity was targeted to female students and postdocs.

5. **Meeting.** An informal meeting was organized on Thursday at 6:00 pm. Some of the topics that we discussed were: the need to reinforce the existing network of women in mathematics in Latin America, the organization of the next conference in Colombia in 2020, and feedback about aspects that can be improved in the next meeting.

The following points were concluded upon :

1. The first conclusion was that is important to reinforce the existing networks among women mathematicians in Latin america. In order to strengthen these connections, create new ones and make them visible, we plan to design a web page.

2. It was agreed to organize a third conference of women mathematicians in Latin America. This conference will be organized by the Gender and Equity Commission of the Colombian Mathematical Society, in Colombia in 2020.

3. Some suggestions made by the participants to be implemented in future meetings were: to have more time for discussion and socialization, to have more workshops and round tables with specific questions. The participants consider important to keep the poster session and the social sciences talks.

<div align="right">Report by María Isabel Cortez</div>

4 India CWM funded activities : Short Activity Report
April 2017 – mid February 2018

In the period April 2017 – March 2018, CWM will have supported the following activities of the Indian Women in Mathematics (IWM) initiative.

a) Distinguished Overseas Visitor Programme

I. Prof. Apala Majumdar, University of Bath, UK toured India in July 2017 and gave talks at Bangalore, Mysore and Belgavi.

II. Prof. Sara Faridi, Dalhousie University, Canada, shall be touring India in the third week of February, 2018, to deliver 3 talks; one each at IIT-Bombay, Mumbai, Goa University and at Visvesvaraya National Institute of Technology (VNIT), Nagpur.

b) IWM Annual conference held at the Indian Institute of Sciences (IISc), Bengaluru during 13--15 July, 2017.

1. Supported Activity Details:

Indian Women and Mathematics (IWM) is a collective of Indian mathematicians, supported by the National Board for Higher Mathematics (NBHM) set up with the objective to encourage more Indian women to pursue higher education in mathematics and to organize events and networking opportunities that will enable them to take up careers in mathematics. For more details see https://sites.google.com/site/iwmmath/ .

 In 2017-18, CWM supported some of the IWM activities. The details of each of the activities are as follows:

a) Distinguished Overseas Visitor Programme

The Overseas Visitor Programme of IWM envisages inviting an established overseas woman mathematician to give lectures at and interact with the mathematics faculty and students at different Indian Universities, preferably located in different cities/towns. It is hoped that the visits to the different institutions, besides giving the students and faculty an opportunity to exchange mathematical ideas with the visiting mathematician, shall also provide a role model – a woman with a successful career in mathematics.

There has been one visitor under this programme in 2017 and another visitor has been invited to visit India in the 3rd week of February 2018 . The details of their visits are as follows:

Prof. Apala Majumdar, University of Bath, UK toured India in July 2017 under the Visitor's programme. She delivered a plenary lecture and took part in the panel discussion at the 2017 IWM annual conference at IISc, Bengaluru. She also gave a talk each at Rani Channamma University, Belgavi and University of Mysore, Mysuru entitled Nematic Liquid Crystals: at the Triple-Point of Mathematics, Physics and Applications. These lectures were delivered in July 2017.

Prof. Sara Faridi, Dalhousie University, Canada is invited in the third week of February, 2018, to deliver 3 talks; one each at IIT-Bombay, Mumbai, Goa University and at Visvesvaraya National Institute of Technology (VNIT), Nagpur.

Under the National visitors' program of IWM, Dr. Anisa Chorwadwala, IISER Pune and Dr. Shreemayee Bora, IIT Guwahati, have been visiting 3 to 4 institutions in remote areas in Western India and North-eastern India recently to give talks to encourage Indian women. They also talked to women students about IWM, CWM, IMU. We plan to support their visits for a nominal amount from CWM funds, especially paying for refreshments and publicity material such as a banner/poster.

b) IWM Annual conference held at the Indian Institute of Sciences (IISc), Bengaluru during 13--15 July, 2017.

The annual conference (2017) was held at Department of Mathematics, Indian Institute of Science (IISc), Bengluru during the period July 13–15, 2017. There were 73 participants and most were women. The conference had 4 one-hour plenary lectures, 4 invited lectures of 45-minute duration, and 4 invited talks by young women mathematicians of 35-minute duration. In addition to this, there were parallel sessions of contributed talks and poster presentations by research students and young faculty. A mini-course on Spectral Theory and a panel discussion entitled Women in Mathematics: Perspectives from Science and Mathematics. More information can be found at https://sites.google.com/site/iwmconference2017iisc/.

The expenses of travel within India, including local conveyance, of some of the invited speakers at the 2017 annual conference were covered by the CWM grant to IWM.

A detailed report will soon be posted on the Activities page of the IWM website.

In addition to the visitors' program and the annual IWM conferences in 2017 (Indian Institute of Science, Bangalore) two regional mini workshops, one in IISER Bhopal in Central India and one in CUSAT, Cochin in Southern India were held as part of IWM activities.

2. Conclusions and recommendations:

IWM executive committee members find the support of CWM very useful for networking among women mathematicians and to popularize mathematics in remote parts of India through the visitor program. As a part of IWM activities supported by CWM, we have planned to reach out to women in mathematics from SAARC (South Asian Association for

Regional Cooperation) countries to take part in our annual conference planned to hold in June 2018 at Shiv Nadar University (SNU), Uttar Pradesh, India. This will given opportunities to women in mathematics from SAARC countries to interact. We recommend to hold such activities involving nearby countries which may be useful.

Report by Riddhi Shah

5 Iran: The first gathering of women in the Iranian Mathematical Society- August 21, 2017.

The event was organised in Bu-Ali Sina University, Hamedan, Iran and was the first of its kind. The number of attendees in the gathering were 60, and the number of women attendees was 50 from different universities in different cities of Iran.

A video clip about Maryam Mirzakhani's life and works, the first Iranian Fields Medalist was made by the organizers for the opening session. The first 4 speakers were the invited speakers (two women and two men). There were 2 contributed talks were had been chosen from the 6 submitted ones. The final session was a round-table discussing about the aims and scopes of establishing women committee in Iranian Mathematical Society (IMS).

The gathering was one day before the Annual Iranian Mathematics Conference, which held during 22-25 August at the same venue. During the conference, the organizers attended a meeting of executive council of IMS, and the annual general meeting of IMS, talked about the committee for women and its intended activities. The establishment of the first committee of women in IMS was approved, and hopefully the first committee will start its activities in 2018.

Report by Mojgan Mahmoud

6. Japan: Women in Mathematics- A panorama of contributions, 29-30 July 2017.

The event was organised in the Mathematics Department, Hokkaido University, Sapporo, Japan. The workshop had 16 registered attendees, 9 of which women, from 4 different countries: Germany, Italy, Japan and Korea.

This workshop which consisted of 7 technical talks had the goal was to showcase contributions of both senior and young women mathematicians pertaining to the themes:

1. Applied Algebraic Topology

2. Singularity Theory and Topology

3. Dynamical Systems

As part of the workshop, a panel discussion "A report on experiences of women in STEM" has been organized on July 29 in collaboration with the Support Office for Female Researchers (FResHU) of Hokkaido University.

The main idea of the panel discussion was to share and discuss the various issues that women researchers face during their careers. The panel involved:

Prof. Eva-Maria Feichtner, Mathematics Department, Bremen University, Germany;

Prof. Yukiko Iwata, Faculty of Liberal Arts, Tohoku Gakuin University, Japan;

Prof. Yeonhee Jang, Mathematics Department, Nara Womens University, Japan;

Prof. Yoshie Sugiyama, Mathematics Department, Kyushu University, Japan;

Prof. Simona Settepanella, Mathematics Department, Hokkaido University, Japan, as a moderator,

and Fernando Garcia, as a translator, to help facilitate communication with non English speaking students in the audience.

After a short introduction by Simona Settepanella, each panelist introduced herself and the discussion then was organized along 3 themes:

- early career issues (Yukiko Iwata)

- balancing career and personal life (Yeonhee Jang)

- institutional issues (Yoshie Sugiyama).

The undertaking to organize a mathematical event in Japan with all women speakers proved to be very ambitious for the organisers. Even with the breadth of topics represented at the summer school, it was hard to bring together a critical number of women mathematicians, let alone female students. The percentage of female students in mathematics in Japan, at undergraduate and graduate level, is still very low compared to the United States and Europe. Just as an (alarming) example, the current number of female Ph.D. students at the Mathematics Department of Hokkaido University is 0.

These circumstances call for rather different measures. An emphasis should be placed on recruiting young women, high school students and first year students for mathematics through targeted information and early personal mentoring. Having women mathematicians appear in visible roles within general research activities (plenary speakers, mini-course lecturers) alongside with enabling a personal contact between young female attendees and the speaker could be a promising format.

On a level of tying and intensifying personal connections however, the meeting was very successful. Professors Settepanella and Sugiyama will meet again shortly at the MSJ Autumn Meeting at Yamagata University and will discuss, jointly with other mathematicians of MSJ, possible activities to promote women in mathematics in Japan.

Report by Eva Maria Feichtner

7. Mexico Festival Matemático Oaxaca 2017

The Festival Matemático Oaxaca 2017 (Math Festival) has had already six editions in Mexico City since 2010, the last one during 2016 with an attendance of approximately 52,000 visitors. It has also been presented in other cities, such as Cuernavaca and Querétaro. This was the first time that it was presented at Oaxaca city.

The general objectives for this Festival were:

- To modify bad preconceptions about mathematics in the population of Oaxaca city and nearby municipalities.

- To introduce the concept of "alive maths" with playful activities based on modern mathematical theories.

- To provide evidence of the relationship of mathematics with people's daily lives, using examples in their community and occupation.

- To show that math is not just about numbers.

- To promote mathematical culture, with an emphasis on young women and girls.

- To contribute on the training of teachers and student volunteers, to replicate the model in various communities of Oaxaca state.

The Festival Matemático Oaxaca 2017 was held on November 11 to 13th, 2017 as part of a bigger event held by the Math Institute of the UNAM (National Autonomous University of Mexico) called the VI Festival del Conocimiento. The event was held in the Plaza de la Danza, a public place, and we attended visitors from 9 to 14 hours, each day.

For this Festival ten different activities were displayed, coordinated by seven students who are doing their social service at the Math Institute and three members of Matemorfosis, a math communication group from CIMAT, Guanajuato. The activities presented were:

- Linear combinations (Agüitas)

- Bubbles (Burbujas)

- Probability (Probabilidad)

- Digestible math (Matemáticas digeribles)

- Graphs (Gráficas)

- Sum cube (Cubo Soma)

- Rectangles (Rectángulos)

- Pythagoras' puzzle (Rompecabezas de Pitágoras)

- Frogs and solitaire (Ranitas y Solitario)

- Untangle (Desanúdate)

Beside the coordinators of each activity, there was a group of 55 volunteers that were residents or lived near Oaxaca city. This group was composed mainly of teachers and students. The volunteers received a previous training of 12 hours long to be able to attend all the activities, on November 8, 9 and 10th at the Casa de Cultura Oaxaqueña. During the training, we emphasized the importance on encouraging girls and young women towards the activities and math since they were the goals for the project and all daily live examples that were given were related to women or were emphasizing how women contribute and work with Math.

The Festival had an attendance of 1800 visitors during the three days of the event. During Saturday and Sunday, the public that attended was mostly families, where parents and children participated equally in the activities. On Monday, it was mainly attended by several schools from the primary level to high school that attended with their teachers.

During this Festival we were able to show a different vision of what mathematics is to the public of Oaxaca and its surroundings. This was possible through the examples in everyday life, which were adapted to the work and interests of each person who attends the activities. Most of the public expressed interest in discovering mathematics in areas other than school that surprised them and that do not involve numbers, operations or formulas.

Through training and experience at the plaza, a base was laid for several of the volunteers to continue their work of dissemination, develop new materials and develop playful activities. These efforts will continue for 2018 at the City of Oaxaca, in nearby municipalities and even in towns that are located at the Oaxaca's highlands, aimed at different type of publics.

In addition, links were established with participating teachers to continue working on similar events in the future.

We collected data during the Festival, and we are still analyzing it, about the efficiency of each activity in order to understand how we could encourage girls and young women to get involved with Math. We know that we have managed to get a lot of positive responses from them and that they really showed interest in the activities.

For now, we do have insights that women (specially girls and young ones) were better performing with most of the activities at this Festival than they were doing in previous festivals and we will try to publish our results in the future. For now, we can say that further analysis is needed to establish the way we present the activities for improving girls and young women participation.

<div align="right">Report by Paloma Zubieta López</div>

8. Morocco: W-PACOM
Women in Mathematics for the social development of Africa, 6-7 July 2017.

The event named as W-PACOM was organised in Rabat, Morocco. W-PACOM was the first edition of a satellite meeting of the Pan African Congress of Mathematics which takes place

every fourth year. There were 54 participants out of which 39 were women. Around 14 countries/states were represented in this meeting.

The technical presentations of the W-PACOM were made by Professors Nadia Raissi (Mohammed V University of Rabat), Mercedes Siles Molina (University of Malaga) and Prof. Eunice Murheiti (University of Dar es Salam). These lectures were followed by contributions of Rasika Ettoussi (Faculty of Sciences and Technologies, Beni Mellal) and Amira Makhlouf (Mohamed Seddik Ben Yahia University of Algeria).

The second day began with the lecture of Prof. Aissa Wade (Pensylvania University USA and AIMS Senegalon) . This presentation was followed by the lecture of Marie Françoise Roy (University of Rennes). These lectures were followed by contributions of Dr Bouchra Ben Amma (Moroccoon) and Dr Adegboye Zamurat (Kaduna Poly of Nigeria).

On Thursday 06 July 2017, a discussion on AWMA and CWM took place. This was led by Marie Françoise Ouedraogo, president of AWMA and Marie Françcoise Roy, chair of IMU-CWM. It began with short presentations of the history of the two organizations and their objectives. Marie Françoise Ouedraogo gave a brief history of the creation of AWMA and presented the different members of the standing committee. She also explained the main objectives of the association and the different activities that have taken place so far. She also emphasized the remaining things to be done. Among others, we have

- to update the database of women with doctorate degree in Africa

- to make booklets with women mathematician in Africa as role model for young girls

- to organize scientific workshops, schools or conferences in specific areas of mathematic

- to have a meeting in a central African country

One also needs to encourage the creation of national AWMA-association such as the ones existing already in Ivory Coast, Senegal, Tunisia, Cameroon, Kenya and Nigeria.

Then Marie Françoise Roy talked about IMU-CWM, the International Mathematical Union Committee for Women in Mathematics. She presented the committee's initiatives that she is leading for 3 years and highlighted all the various successful activities they conducted thus far:

- encourage networks of women at the regional level (in Africa, in India, in Latino-America)

- support schools and conferences in the developing world

- funding activities related to women in mathematics

She also presented the CWM flyers which contains a brief description of the objectives and activities of the committee. She distributed them to the participants and gave some announcements:

- CWM is organizing a satellite meeting of ICM2018 in Brazil: World meeting for women in Mathematics (WM)^2.

- The IMU proposal to ICSU (International Council of Scientific Unions) for the project "A Global approach to the Gender Gap in Mathematical and Natural Sciences : how to measure it, how to reduce it ?" has been successful. The award is of 300,000 Euros for the period 2017-2019. IMU was one of the two leading applicants. See https://icsugendergapinscience.org/.

After their presentation, the floor was open to questions that leads to the following discussions:

Promote mathematics among girls: Some participants shared their experiences with the audience and explained the progress they have made thus far in their countries.

 The fundings issues of AWMA: too few people that are paying their annual fees to the association and this is far from enough to support the activities of AWMA. One needs to find a way to become financially independent in order to be able to make activities where many AWMA members can participate in the future.

Collection of the fees payments to AWMA: An efficient way to make people pay their fees to AWMA each year was also discussed. One proposal was to encourage the creation of national AWMA associations, then the president of each local association, would be in charge of collecting the fees of each member in that country and send it to the treasurer.

Database of Good Practices: This is a way to collect all the good experiences that have been done in different countries in order to reach young learners and encourage them to study mathematics. This is one of the activities initiated by the ICSU. Finally, about 10 new members paid their fees during the meeting.

The workshop was a follow-up activity of AWMA and the future activities are:

- To continue to update the database of women with doctorate degree in Africa

- make booklets with women mathematicians as role model for young girls

- organize scientific workshops, school or conference in specific area of mathematics

- have a meeting in a central African country

For the future editions of W-PACOM it would be better to hold the satellite meeting just before PACOM, and to include a panel discussion on women in mathematics inside PACOM so that it is possible to women to follow PACOM activities and better integrate the women to the mathematical african community. In Rabat, the dates of WPACOM were included inside the dates of PACOM and the location of WPACOM and PACOM where at some distance which made the contacts difficult. However, a short report of W-PACOM was presented by Marie Françoise Ouedraogo during PACOM closing ceremony.

Report by Marie Françoise Ouedraogo

9.Nepal: Symposium for South Asian Women in Mathematics
12-15 October 2017.

The Symposium for South Asian Women in Mathematics (SSAWM-2017) took place atTribhuvan University, Kathmandu, Nepal. Out of 61 participants, there were 59 women participants from 12 countries including Nepal, Bangladesh, Canada, France, India, Indonesia, Italy, Japan, Korea, Pakistan, Philippines, USA.

The purpose of this event was to promote scientific communication in mathematics, to establish a mathematical network for sharing and communicating with women mathematicians, experts and organizations with similar goals in this region. The symposium brought together leaders of professional organizations for women working in mathematical sciences, particularly in mathematics teaching, research and mathematics education. Participants had the opportunity to interact and share their research work in both pure and applied fields of mathematics, they discussed how to support and promote researchers and professionals in the respective countries, and exchanged experiences with outreach activities for female students. A major goal of the Symposium was to strengthen and create opportunities for women in mathematics in Nepal and motivate the undergrad Nepalese students especially girls. Another goal was to create a regional nucleus for women in mathematics.

The symposium made an effort to create a valuable experience for the participants   during four days. It concentrated on different aspects of different topics each day and made sure even the academic lectures had a component related to women in mathematics. There were two public speeches, research talks, several panel discussions and break out sessions.

During the discussion of "Where do we go from here?" Sylvia Wiegand asked for suggestions and also for volunteers to be part of a committee to help women in mathematics in Nepal. So far the committee has Sylvia Wigand (USA), Aihua Li (USA), Sara Faridi (Canada), Sunsook Noh (Korea), Dhana Thapa (Nepal), Suchitra Bajracharya(Nepal), Riddhi Shah (India) and Geetha Venkataraman (India).

This committee will help find the best ways to help Nepali women who would like to do advanced research work in mathematics. As things are now, it is difficult for men and women in Nepal to work on a Ph.D. and difficult for them to continue to do research if they stay in Nepal.

 The Symposium has inspired and motivated Nepalese women participants. It is planned to disseminate the suggestions and related information to all, using the website. Home some of the suggestions can be implemented.

<div align="right">Report by Dhana Thapa</div>

10. Tunisia: Second meeting of the TWMA - The First International Mathematical School on Algebraic Geometry and Application, 11-15 September 2017.

The event was organised in Hotel Eden Village Yadis Hammamet by women organizers. There were 24 participants out of which 15 were women. About 7 countries were represented and 16 participants were from Tunisia.

Academic program

- Two mini-courses for a total hourly volume of 15 hours (*Real Algebraic Geometry: Quantitative and Algorithmic Methods by Marie Francoise Roy and Elliptic curves: Theory and Applications to Cryptography by Elisa Lorenzo Garcia*)

- Eight Lectures (40 mn for each lecture) and

- Three mini-projects presented separately and publicly by three PhD Students (40 mn each one).

Two mini-projects supervised by Marie-Françoise Roy were selected by two female PhD Students (Najoua Essamaoui from Morocco and Aurélie Mahi from Ivory Coast). One mini-project supervised by Elisa Lorenzo Garcia was selected by a female PhD Student (Marwa Soula from Tunisia).

Networking activities

- A **round table** was organized to get to know each other, where each participant presented his/her table neighbor in order to establish a networking and exchange informations between the participants.

- A ceremony was held to honor mathematicians and award TWMA mathematics prizes.

    TWMA Honor Trophies have been awarded to:

- Mrs. Leila Ben Abdelghani, first Tunisian women who carried out her thesis on the knot theory.

- Mrs. Marie-Françoise Roy, CWM Chair, for her great support and encouragement for our association from the very beginning.

- Mr. Chedly Touibi, Professor Emeritus of Algebra and former Dean of the Faculty of Sciences of Tunis.

- Mr. Saïd Zarati, Professor Emeritus of Topology and co-founder of the Tunisian Mathematical Society

- **TWMA Mathematical Awards :**

- TWMA Award for the Best PhD Thesis in Pure Mathematics for Tunisian Women.

- TWMA Award for the Best PhD Thesis in Applied Mathematics for Tunisian Women.

These two awards are annual. The first edition of these two awards is for the year 2016 and is aimed at all Tunisian women in Tunisia and abroad who have defended their PhD theses in pure and applied mathematics between 01 January 2016 and 31 December 2016. These awards are sponsored by the Arab Tunisian Bank with 1000TND for each award.

The winners for this first edition are Mrs. Emna Jaïem (Applied Mathematics) and Ibtissem Ben Aïcha (Pure Mathematics). They were awarded during the TWMA Second Meeting.

The TWMA was founded in June 2015. It organized its First Meeting on 12 May 2016 under themes: « Tribute to the Tunisian Mathematician Women » and « Mathematics, skills for the future ». This first meeting was a success. For its first meeting, the TWMA was supported by the CWM. For its Second Meeting in 2017 (object of this report) was also supported by the CWM, The motivation to organize such a school comes from the fact that the mathematical specialty of Algebraic Geometry is very little developed in Tunisia. The second meeting was a success in terms of organization and good scientific quality of mini-courses, conferences and mini-projects. The TWMA wishes to continue its different activities that one can find when visiting its website, especially its annual meeting with a different theme each time.

The TWMA highlights the rather low participation of Tunisians (students and teachers) due to the lack of funding from the various academic Tunisian institutions (universities, institutes, laboratories and research units).

Report by Saïma Khenissy

11. South Africa
Workshop for African Women
in Discrete Mathematics and its Applications, 23 to 25 January 2018

The workshop took place at AIMS South Africa, Muizenberg.

Organisers

Nancy Ann Neudauer, Pacific University, Forest Grove, OR 97116, nancy@pacificu.edu

Martha Kamkuemah, Stellenbosch University; Jeff Sanders, African Institute for Mathematical Sciences-South Africa (AIMS-ZA); Rene January, AIMS-ZA

AIMS-ZA provided tremendous support — without them this meeting would not have been possible. They provided a large lecture room for the main workshop and other space for the event, staff to help organize the workshop and logistics, managed the budget, coordinated travel of participants, provided lodging for several attendees, meals, teas, reception, etc.

1. Supported Activity Details:

51 registered attendees (additional mathematicians attended some of the activities, 65 in one session) among them 32 women (13 women speakers)

Countries: Zimbabwe, Nigeria, Malawi, Cameroon, Namibia, Botswana, Zambia, Kenya, Gabon, Madagascar, Ghana, Sudan, Egypt, South Africa, Democratic Republic of Congo, Benin, Somalia, Algeria, France, Austria, United Kingdom, Spain, United States (Oregon and Washington)

2. Activities about women in mathematics:

There was a long panel discussion on Building Mathematical Communities like the one we are trying to build with this Workshop. Much of this panel specifically addressed the situation for women mathematicians. Participants discussed what they were doing to try to change this in their own countries, and proposed ideas for what might change. One participant had been active in trying to make a change in her home country, Malawi, and discussed how she now also met with men to let them know what they could do to make it possible for women to succeed in the field. There was a discussion of cultural patterns that have made this difficult, including women not being allowed to meet or collaborate with a male mathematician by their husbands.

There was ample time for more informal gathering in a workshop setting to work together on open problems and panel discussions on topics including increasing the number of women in mathematics in Africa. Topics included Creating an environment that includes women mathematicians, Finding grants and other sources of funding, and Balancing work and family.

The second day we had a discussion that focused on Women in Mathematics in other parts of Africa that were not well-represented at this meeting, and how we might reach out to them for future meetings. We discussed the best place to host another such meeting, and whether it would work, for example, in Kigali. The discussion also turned to difficulties in finding funding for students and for travel, discussing how it might be possible to continue to have workshops like this in the context of the current funding picture.

After the Opening Reception, we showed the movie Hidden Figures. This was followed by a discussion, during which African mathematicians said they could not believe it took place in the United States; some said through the entire movie they thought it was in South Africa! The idea for adding the movie to the program arose when I learned that the US State Department is showing that movie throughout the developing world, trying to encourage girls and women into STEM fields:

https://www.npr.org/2017/10/28/560554713/hidden-no-more-encouraging-girls-to-pursue-stem

We ended with an open discussion called "What's next?" Here we recapped some of our previous discussions and tried to make a plan for future meetings of this type, and building a network starting with those who gave talks at this workshop.

3. Academic activities: This workshop on discrete mathematics and its applications featured talks by women on their research in various areas of graph theory, combinatorics, and discrete optimization, each including some introduction for the non-expert. This was at the continental level with women from many African countries in attendance and with a goal of establishing a network of African women with common mathematical interests. There were also speakers from Europe and from the United States. Thirteen women gave talks on their research.

In addition, there was an Open Problem Discussion in which we posed open problems and suggestions to tackling them. Because of the diversity of fields in discrete mathematics represented, there were truly innovative ideas for approaching problems coming from the new perspectives.

There was a workshop called Computing Discretely with Sage which introduced participants to Sage and Open-source software and computer algebra systems they might use to solve problems or test conjectures. This was very well attended — even though 51 were officially registered for the conference, more than 65 were in attendance for this session!

See attached schedule for titles of talks and abstracts for more details, also available on the website:

https://sites.google.com/aims.ac.za/women-in-discrete-mathematics/home

In addition to women speakers and participants, the conference was open to professors, lecturers, researchers, and students from participating universities and from the host institution.

4. Conclusions and recommendations:

The main goals of this workshop are to build a network of African women with common mathematical interests and to increase the visibility of women in mathematics to African students, researchers, and professors. We hope that this network will later provide support to participants as they advance through their graduate work and their careers. We proposed follow-up activities to encourage future support activities and mentoring through the network established at this workshop.

There were everal discussions on repeating this Workshop. It looks like it will be repeated, and take place frequently on a local or country-wide scale (women mathematicians from across South Africa) and also will take place, but perhaps every few years, on a continental scale, with involvement also from women in the US and Europe. There was a lot of interest in continuing this, and long discussions on the best location, sources of funding, the mathematical focus of future meetings, etc.

Further, there was interest in starting some collaborations. A Session on Open Problems drove this discussion, and some joint projects were proposed.

Outcomes from this event include

- Increased visibility of women mathematicians

- Creating a network of African women with common mathematical interests

- New project with invitees, possibly leading to journal publication

- Support network serving participants as they enter PhD programs and progress beyond

- Introduction to discrete mathematics for some and increased exposure for others

- Experience in organising or attending a conference (especially for the students)

<div align="right">Report by Nancy Ann Neudauer</div>

12. Vietnam : *International School and Workshop on Commutative Algebra, 5-8 September, 2017.*

The event was organised in Ton Duc Thang University, Ho Chi Minh City, Vietnam. There were 66 participants from about 19 universities and institutes out of which 55 were Vietnamese participants and 11 were from Japan. There were 19 Vietnamese and Japanese female participants.

There were two series of lectures that were given by Prof. K. Yoshida (Nihon University, Japan) and Prof. Shimomoto (Nihon University) and 14 scientific talks out of which 5 were by female mathematicians. There was an interesting section (chaired by Prof. Le Thi Thanh Nhan) on the evening of 5th September 2017 for participants to discuss about the topic "How to support female Mathematicians". In the discussion, participants talked about the challenges that women face in taking up an academic and research career were discussed. A number of remarkable ideas were raised by Prof. Nguyen Thi Dung, Prof. Nguyen Thi Hong Loan, PhD student Luu Phuong Thao, PhD student Nguyen Thu Hang, etc. Especially, the idea given by Prof. Shimomoto (from Nihon University Japan) encouraged the female mathematicians : "Women or men should not be discriminated in mathematics. Because, mathematics itself and all sciences do not distinguish between women and men. However, it is more difficult for women when they study and research mathematics because they have a lot of responsibilities in their life. In Japan, there are a few female mathematicians. So, I admire Vietnamese female mathematicians. I know that, in Vietnam, despite of difficulties, female mathematicians have many efforts and they get better results in their research".

The organisers found that the "International school and workshop on Commutative Algebra" was very interesting, important and necessary for all participants, especially for Vietnamese female mathematicians. This support helped a lot in the development of female mathematicians in Commutative Algebra in Vietnam. In the effort to create a strong female research team in Commutative Algebra in Vietnam, it has been decided to organize the next international school and workshop on Commutative Algebra from 17th to 21st January 2018 at Thai Nguyen University, Vietnam.

<div align="right">Report by Lâm Hoàng</div>

Part II: Participation to AWM Symposium in Los Angeles

Brief report and personal impressions by Gabriela Araujo-Pardo Mathematics Researcher at Mathematics Institute of the National University of Mexico (UNAM) ; Coordinator of Gender and Equality Comission (CEG) of the Mexican Mathematical Society (SMM).; Ambassador from México of the Comittee of Women of Mathematics (CWM) of the International Mathematical Union (IMU).

The Association for Women in Mathematics Research Symposium 2017 was held at the University of California Los Angeles (UCLA) April 8 -9, 2017. The symposium showcased the research of women in the mathematical professions. It featured four plenary talks, special sessions on a broad range of research in pure and applied mathematics, and poster sessions for graduate students and recent PhDs.

The event lasted a day and a half and 95% of the participants were women. Although my area of specialization is discrete mathematics and this subject was very little touched on in the conference, I could appreciate the enormous quality of mathematics and the diversity of areas of interest, regions and ages in the speakers, both in the special sessions and in the plenary talks. The four plenary talks were interesting and the combination of youth and quality of research of two of the speakers: Svitlana Mayboroda of the University of Minnesota and Mariel Vázquez of the University of Davis, left me pleasantly surprised. Both researchers have already received, in spite of their young age, various prizes and recognition for their work. The careers and expositions of the four plenary speakers show that our community has mathematical women who are recognized as "role models" and who continue to demonstrate that making a career in mathematics for women is certainly possible and that without doubt more can be successfully achieved.   It should be noted that the other speakers and young postdocs who exhibited their posters also provide such examples.

I once again found that academic meetings between women are characterized by "sorority" (feminine solidarity). The academic environment is much more relaxed, at least for us, in contrast to the situation in which the audience at the conferences is made up of 80% men and 20% women, the approximate percentages that appear in mixed lectures in most special sessions and plenary lectures. Other clear signs of solidarity and empathy are that the researchers show a special interest in "academically sheltering" researchers who are starting their careers or in the process of becoming established, also that the AWM female community is interested in continuing the work of organizing conferences in different areas with majority female participation, all in order to continue creating support networks.

The participants were interested in the short presentation I made of the work of the CWM and I received quite a lot of questions related mostly to the different types of financing granted. CWM posters were shown at various places at the meeting location and CWM flyers were distributed to all participants.

In summary, I feel that my attendance at this symposium was useful to our association and I enjoyed the conference both academically and personally.