



Committee for Women in Mathematics

CWM call 2018: report on funded activities

Summary

The International Mathematical Union Committee for Women in Mathematics (IMU CWM) sponsored a number of events in 2018 that aimed at establishing or supporting networks for women in mathematics at both the continental or regional level and with priority given to networks, workshops, schools and projects in developing and emerging countries.

IMU CWM received 56 applications that could be classified in the categories Networks, Projects, Schools, Individual support and Workshops. Out of this, 12 activities - 8 Networks, 2 Projects, 1 School and 1 Workshop were funded. The total amount that was funded for these activities is 26905 euros. The *Network Activities* were at Austria, Colombia and Mexican, Nigeria, Balkan Region, El Salvador, Uzbekistan; *School and Workshop* were at Italy and Uruguay; *Projects* were at Africa, UK and Germany.

A total of about 1450 participants, with about 2/3 women, attended the various meetings.

The list of the activities is given as a table and detailed reports follow for each event.

For more information on other CWM initiatives, see

<https://www.mathunion.org/cwm/initiatives/cwm-initiatives/>

Marie-Fançoise Roy and Neela Nataraj

SUMMARY TABLE OF ACTIVITIES

NETWORK ACTIVITIES

Activity number	Country	Dates	Place	Nature
1	El Salvador	14-16 March, 2018	El Salvador	Addressing the Gender Gap in Mathematics
2	Balkan region	16-17 May, 2018	Faculty of Elec. Engg. and IT, Macedonia	First meeting of Women in mathematics in the Balkan region
3	Colombia and Mexican	29 May - 2 June 2018	Universidad del Norte	1st Joint meeting of Mexican and Colombian Societies
4	Nigeria	25-26 June, 2018	University of Ibadan, Nigeria	Conference, West-African Chapter of AWMA
5	Austria	3-7 Sept 2018	Uni. Graz	EWM General meeting
6	Uzbekistan	October 2018	Uzbekistan	Uzbek Women in Mathematics, Regional Meeting of CAWMA
7	Ethiopia	10-11 December, 2018	Addis Ababa	First Regional Workshop of AWMA in Eastern Africa
8	India	21-23, June 2018, 27-28 October 2018	Delhi	Annual Conference, Regional workshop and Visitors Programme

SCHOOL AND WORKSHOP

Activity number	Country	Dates	Place	Nature
9	Italy	16-27 July 2018	ICTP, Trieste	Summer School in Dynamical Systems
10	Uruguay	3-7 December 2018	Montevideo, Uruguay	Mathematics in the Southern Cone (workshop)

PROJECTS

Activity number	Location	Nature
11	Africa	Portraits of Women Mathematicians in Africa
12	UK and Germany	Faces of Women in Mathematics Film

DETAILED REPORTS

NETWORK ACTIVITIES

1. Global approach to the gender gap in the natural sciences and mathematics: How to measure it, and how to reduce it?”, 14-16 March in San Salvador, El Salvador

Contact Information:

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Supported Activity Details:

Number of attendees: Day 1: 410 Day 2: 442

Number of women attendees: Day 1: 261 women Day 2: 234 women

List of Countries (or States) represented: El Salvador, Dominican Republic, Cuba, Uruguay, Colombia, Mexico

A short report on activities about women in mathematics:

The Regional Office for Latin America and the Caribbean of the International Council for Science (ICSU ROLAC); the Ministry of Education of El Salvador (MINED); the Vice Ministry of Science and Technology of El Salvador; and the Committee for Women in Mathematics of the International Mathematical Union (CWM-IMU) co-organized the workshop entitled: “Global approach to the gender gap in the natural sciences and mathematics: How to measure it, and how to reduce it?” that took place in San Salvador, El Salvador on March 15-16, 2018.

This Workshop addressed the problem of the gender gap in Mathematics and sought to share "good practices", define and propose concrete actions in the medium and long term to significantly change the landscape of Mathematics in the Region. The event was inaugurated by the Honorable Minister of Education from El Salvador, Ing. Carlos Canjura; ICSU ROLAC's regional director, Dr. Manuel Limonta; and Dr. Liliam Álvarez, fellow member of the Cuban Academy of Sciences.

The event had the participation of relevant Latin American experts in gender and mathematics: Elizabeth Rincón, (Dominican Republic); Zelmira May (UNESCO, Uruguay); Ángela Camacho (Colombia); Gabriela Araujo (México) and Liliam Álvarez (Cuba). In

addition to these, Salvadoran teachers, researchers, and post-graduate students participated in the meeting.

The workshop was well-received by an enthusiastic audience and by the local authorities. The experts motivated the participants and encouraged them to make a difference in their own capacities to reduce the gender gap. Finally, it was agreed that experts, local authorities and ICSU ROLAC would continue working and building upon the foundations set on this successful workshop.

A short report of academic activities:

The workshop featured lectures on topics such as: “Building bridges - educating girls and women in STEM”; “Women teachers of Mathematics in El Salvador. Presenting the current panorama”; “Mathematics is the Language of Physics”, amongst others. Debates, panels, discussions, group work, and presentations were also activities carried out in this activity, which had two-day combined attendance of approximately 700 people, most of them teachers from various academic levels, and students related to natural sciences and mathematics.

On day one of the workshop, there were lectures by Dr. Elizabeth Rincon, Dr. Zelmira May, Dr. Angela Camacho, and Gabriela Araujo. The second day started with a video presentation by Dr. Gabriela Araujo which dealt with women in mathematics. Then the audience was split into three different groups and were given some time to discuss on their experiences, best practices, common problems and challenges and alike. The representatives from each group was asked to present a summary of the discussions held in each group. On day two of the meeting, presentations as well as different panel sessions, debates and group discussions were held.

The workshop successfully gathered well-known and recognized math and gender experts with local authorities and math teachers and students, encounter which allowed a bidirectional exchange of ideas, concepts, roles, challenges and opportunities. The workshop also allowed experts to provide their insights and recommendations for local authorities to reduce the gender gap between men and women in the natural sciences and mathematics, recommendations which can be easily scaled into the regional level.

The specific topics of the lectures were:

- Science and Gender: Local and global strategies
- Women in mathematics, current panorama in Dominican universities
- Building bridges - educating girls and women in STEM
- Women teachers of Mathematics in El Salvador. Presenting the current panorama
- Mathematics is the Language of Physics
- Strategies implemented by the Equity and Gender Commission of the Mexican Mathematical Society to promote study and research in Mathematics - Why Mathematics for development? Are young women motivated by mathematics?
- Gender barriers in Mathematics Why are we so few?
- The ICSU Global Project on gender gaps in the natural sciences and Mathematics.
- Women in the world of Mathematics: academics, researchers, barriers, satisfactions, and challenges.

Conclusions and recommendations:

The workshop had a positive reception in the country, and that can be supported with the fact that more than 800 participants (both days combined) amongst teachers, graduates, researchers, and public in general attended this two-day activity. In conclusion, the workshop successfully addressed an issue of great importance for the country, and motivated local authorities to continue efforts towards this theme. It was agreed to organize a second meeting to further advance the math gender agenda in El Salvador and the region. The concluding remarks of the workshop were provided by Dr. Manuel Limonta, ICSU ROLAC's regional director; and by Dr. Erlinda Hándal Vega, Vice Minister of Science and Technology of El Salvador.

2. Workshop: Women in mathematics in the Balkan region 28-29 May, Skopje, Macedonia (Balkan region)

Contact information:

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Workshop web page: <http://wmbr.feit.ukim.edu.mk/>

Supported Activity Details:

There were around 40 attendees at the workshop, among which 35 were women. They came from 5 different countries (Macedonia, Bulgaria, Albania, Serbia and Croatia) and 7 different Universities. There was attendance from math students and students from technical faculties, master and Ph.D. students and other women mathematicians (teachers and researchers).

A short report on activities about women in mathematics:

The workshop opened with a short introduction and promotion of the Committee of Women in Mathematics (CWM) and its activities by the local workshop organizers. As a part of the workshop there was a panel session dedicated to the science in general in the Balkan region and the place of mathematics among the science. There were two talks dedicated to this problem

- Challenges for the Scientific Systems of Western Balkan Countries, Prof. Dr. Zoran Hadzi-Velkov, Faculty of Electrical Engineering and Information Technologies, Ss. Cyril and Methodius University, Skopje,
- and
- Women, Science and Mathematics, Prof. Dr. Sonja Gegovska-Zajkova, Vice Dean for Education at Faculty of Electrical Engineering and Information Technologies, Ss. Cyril and Methodius University, Skopje.

After this, the panel session, moderated by Prof. Dr. Sonja Gegovska-Zajkova was open. Many problems and discussions arose, starting with the struggles and the accomplishment of the women with successful career in mathematics, their experience with participation in

various activities such as teaching, research and communication, and organizations of scientific events. One of the obstacles that all share is the means necessary to carry any event, and in general the financial problem faced by most of the Balkan region countries. Special part of the panel discussion was dedicated on how to make all the calls for projects and other type of funding more visible and available. At the end, a difficult question regarding the brain drain that is in the Balkan countries was raised, with an effort to discuss how different countries approach in order to resolve this issue.

A short report of academic activities:

The workshop hosted invited lecturers from different fields of mathematics, at different stages of their professional careers, and from different Balkan countries. All the invited lecturers presented their current research work in a form of popular lectures. All the speakers started with introduction of their field of research, current results and their contribution to their scientific field, in an effort to reach out to early-career mathematicians and students. Slot of 25 minutes were reserved for each presentation. The scientific part of the workshop was an opportunity to strengthen the existing professional cooperation, as well as to establish new collaborations among the workshop participants.

Conclusions and recommendations:

It was a very fruitful event. The organisers are grateful to CWM for the opportunity to organize one such event, and they tried to promote CWM and EWM as much as they could. One third of our women participants are members of EWM, but still, the others got familiar with the opportunities that are offered by CWM and EWM. At the end, all workshop participants were informed of the upcoming EWM General Meeting 2018 in Graz, Austria.

3. Gender Equality Commissions of the Colombian and Mexican Societies of Mathematics (Colombia and Mexico), May 30, Baranquilla (Colombia)

Contact information: Florent Schaffhauser
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Supported Activity Details:

A talk by Prof. Sara Hottinger, Coastal Carolina University (USA):
Inventing the Mathematician: Gender, Race, and Our Cultural Understanding of Mathematics.
Approximately 80-100 professional mathematicians and students attended, 30~35% women, almost all from Colombia or Mexico.

Report on the activity:

The meeting, held in Barranquilla from May 29 to June 2nd, 2018, was the first joint meeting between the Mathematical Societies of Colombia and Mexico. The Colombian and Mexican *Commissions for Gender Equality* invited Dr Sara Hottinger, from Coastal Carolina University, to give a plenary talk.

The talk was held on May 30th, 2018 and was attended by about 80-100 people. It is fair to mention that several questions made to Sara at the end of the talk expressed disagreement over the material that had just been presented, which included a discussion about "Math Doesn't Suck: How to Survive Middle School Math Without Losing Your Mind or Breaking a Nail Paperback" by Danica McKellar. The talk generated a lot of discussion among mathematicians and it did open a space to reflect on gender bias in the field of mathematics. It also gave the Commissions for Gender Equality an opportunity to present their actions to an enlarged audience and, hopefully, to generate awareness around the existence of gender issues in the field of mathematics.

4. 2nd Conference of West African Women in Mathematics held at University of Ibadan, Ibadan, Oyo State (Nigeria), 25-26 June, 2018

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Supported Activity Details:

Conference that addressed Gender Inequality Menace: Roles of Employment and Government Policies.

Number of female participants were 72 and this comprised of 56 Nigerian registered members, 3 foreign non-members, 4 invited special guests, and 9 Executive Committee members.

Male participants were 6 Nigerian participants, 3 foreign participants and 4 invited special guests.

All cadres of people in academia, ranging from secondary school students, undergraduates, postgraduates to professors, male and females attended the event.

Report on the activity:

The theme of the conference was **Addressing Gender Inequality Menace: Roles of Employment and Government Policies**. The president of Nigeria Women in Mathematics, Prof. O. O. Ugbebor gave her welcome address, with special thanks to the Dean of the Faculty of Science, Prof. F. O. Ogundare and the Head, Department of Mathematics Dr. U. N. Basse and all other supporters of the event.

The Opening Remark was given by the Vice Chancellor, University of Ibadan, Professor Idowu Olayinka ably represented by the Deputy Vice Chancellor (Administration), Professor Kayode Adebowale. He said the teachers of mathematics should try as much as possible to make mathematics very simple for the students and also put smile in the face of the students. He added that the University produces almost 500 M. Sc. graduates every year, and the University has almost 550 professors.

Goodwill messages were given by:

The Representative of the Governor of Oyo State (Mrs. Kemi Opatunde)
The Vice President, African Women in Mathematics (Josephine Guigy-Wandja)
Representative of the Director and Chief Executive, National Mathematical Centre, Abuja
Representative the President, Nigeria Mathematical Society (Prof. S. Adeniran)
The Head of Mathematics Department, University of Ibadan (Dr. U. N. Bassey)
Prof. Sola Adeniran, the representative from Nigeria Mathematical Society gave his goodwill messages and informed that the Nigeria Mathematical Society supports the meeting.

The DVC (Admin), University of Ibadan, Ibadan declared the conference open. The guest speaker, The Director, Federal Ministry of Education, Abuja, Mrs. Stella Omu, spoke on the conference topic ‘Gender Inequality Menace: Roles of Employment and Government Policies’.

The programme was as follows:

Second session with Plenary Talk followed by parallel sessions having about three (3) presentations each. This session ended by 6:20pm.

Prof. RONALDA BEJAMIN gave a talk on ‘Interplay between Fredholm theory and positivity in general ordered Banach algebras’ . This was followed by Career talk with secondary school girls coordinated by Dr. Deborah O. A. Ajayi.

There were six schools in attendance namely:

1. Methodist Grammar School, Bodija
2. Abadina College, Senior School, Ibadan
3. Abadina Grammar School, Ibadan
4. Oritamefa Baptist Model School, Ibadan
5. Bethel Comprehensive College, Ibadan
6. International School, Ibadan (ISI)

One representative from each school talked on ‘The application of mathematics in our environment’. Certificates of participation, prizes for 1st to 3rd position and gifts for their teachers were coordinated by the vice president, West African Women in Mathematics. The students and their teachers took pictures with Prof. O. O. Ugbebor with the cake presented by the Women in Mathematics, University of Ibadan.

There were about 7 presentations during the parallel sessions after the career talk. There was a Symposium coordinated by Dr. Mrs. Deborah O. Makinde, Secretary, Nigerian Women in Mathematics with six people on the high table.

1. Prof. O. O. Ugbebor
2. Prof. F. O. Akinpelu
3. Prof. Rolnada Benjamin
4. Dr. D. O. Makinde
5. Mrs. Stella Omu
6. Josephine Guigy-Wandja

A lot of points were raised as regards the way parents, individual, society and government treated female children and workers.

1. Bastardization of the female gender
2. Lack of appreciation of the uniqueness in the roles of women
3. Underage marriage menace
4. Trade for Western civilization of the African culture of extended family system.
5. Poverty associated to early marriage resulting in shortened life span of the girl child.
6. Girl kidnapping, trafficking and sexual abuse
7. Unequal opportunity in job employment for female gender compared with their male counterpart.
8. School facilities that are not gender-friendly

A communique was put up as regard our resolution during the conference.

5. European Women in Mathematics General Meeting (Austria), Graz, September 3-7, 2018

Contact information:

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Kathryn Hess Bellwald, École Polytechnique Fédérale de Lausanne, Switzerland,

Elena Resmerita, Alpen-Adria Universität Klagenfurt, Austria,

Carola Schönlieb, Cambridge University, UK.

(<https://sites.google.com/site/ewmgm18>)

Supported Activity Details:

The number of female participants in the meeting was 110, while the total number of participants was 117. The participants have affiliations in Australia, Brazil, India, United

Arab Emirates and the USA, as well as in Austria, Bulgaria, Croatia, Denmark, Finland, France, Georgia, Germany, Hungary, Ireland, Israel, Italy, Macedonia, Netherlands, Norway, Poland, Portugal, Russia, Serbia, Slovenia, Sweden, Switzerland, Turkey, Ukraine, and the United Kingdom.

The grant from CWM was used to support a participant from India.

A short report of academic activities:

The program included a series of three lectures by the EMS lecturer Gigliola Staffilani (MIT, USA), a renowned expert in harmonic analysis and partial differential equations, and five plenary lectures by outstanding women mathematicians selected by the EMS/EWM Scientific Committee.

The plenary speakers come from five countries and cover a wide range of topics in mathematics.

- Shiri Artstein-Avidan (Tel Aviv University, Israel): asymptotic convex geometry
- Ilse Fischer (University of Vienna, Austria): combinatorics and discrete mathematics.
- Alice Guionnet (ENS Lyon, France): matrix models, probability theory.
- Frances Kirwan (University of Oxford, UK): algebraic and symplectic geometry.
- Maryna Viazovska (EPFL, Switzerland): discrete geometry, number theory, approximation theory.

The NAWI Graz lecturer, Naomi Ellemers (University of Utrecht, Netherlands), gave a lecture on unconscious bias and modern forms of discrimination.

The program comprised also ten minisymposia, each consisting of four to six invited talks, on subjects of current interest in mathematics, a presentation of the book “The Ascent of Mary Somerville in 19th Century Society” by Elisabetta Strickland, and a presentation by Lisbeth Fajstrup on Danish women mathematicians. Moreover, two poster sessions took place during the meeting, and the three best posters were awarded prizes.

A short report on activities about women in mathematics:

The EWM general meeting hosted the EWM general assembly, which is the most important meeting of the association.

The meeting featured several networking sessions:

- a reception on the first day,
- a session called Round of Introductions, in which participants are paired up and introduced each other to the whole group,
- small group discussions, with round tables for discussing different topics related to women in mathematics,
- an excursion and a conference dinner.

The meeting celebrated also 30 years of EWM, including a festive ceremony about the history of the EWM and its people, which started with a presentation given by Marie-Francoise Roy. She, as the chair of the Committee for Women in Mathematics (of the IMU), reported on the ICM at Rio and the (WM)² event, warmly recommending the participants to watch the documentary ‘Journeys of Women in Mathematics’.

Extra information

The meeting was supported by AVL, the Committee for Women in Mathematics, Deutsche Mathematiker-Vereinigung, École Polytechnique Fédérale de Lausanne, the London Mathematical Society, NAWI Graz, Österreichische Mathematische Gesellschaft, the Swiss Mathematical Society, Karl Franzens University of Graz, and the Technical University of Graz.

The meeting website provides (<https://sites.google.com/site/ewmgm18>) further details. The next EWM general meeting will be held in 2022 (the location is not yet known).

Based on feedback from participants, that the scientific program and the other activities organized during the meeting were sources of inspiration for many participants.

6. Actual Problems of Mathematics and Mechanics- Meeting of Women of Mathematicians in Central Asia CAWMA – 2018 (Uzbekistan)

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Supported Activity Details:

There were 96 registered participants, mostly women, plus around 21 guest participants. Registered participants came from 4 different countries and 11 different regions of the Uzbekistan distributed as follows.

Countries: Kazakhstan – 14 participants, Kyrgyzstan – 2 participants, Tadjikistan – 1 participant and Turkmenistan – 4 participants.

Regions : Andijan Region, Namangan Region, Tashkent Region, Bukhara Region, Navoiy Region, Fergana Region, Qashqadaryo Region, City of Tashkent, Xorazm Region, Surxondaryo Region, Rep.of Karakalpakstan; Avatanom republic and the city of Uzbekistan, 82 participants.

Report on the activity:

The Khorezm Mamun Academy together with the Physics and Mathematics Faculty of Urgench State University of Uzbekistan organized a Scientific conference with participation of foreign women scientists.

The aim of the conference was to establish scientific relation with the cooperation of women experts in the field of mathematics and mechanics as it is considered as the most active research area in the republic and to support collaboration between them. The conference was also to develop and enhance their effectiveness as well as to establish scientific relation with the leading academic staff of Central Asia in this area, to work with the world mathematicians, foundation, associations and to introduce Uzbek women experts with the

mathematical associations (IMU, CWM, OWSD, CAWMA) and to organize regional section Uzbek Women in Mathematics under the Association Uzbek Mathematical Society and Central Asian Woman in Mathematics Association (CAWMA).

The conference was aimed at the implementation of scientific and technical programs in priority areas of science (Pure and applied mathematics and information technologies), the further strengthening of international scientific cooperation, the involvement of women scientists in this field of science and the promotion of their ties with leading experts in this area. Participation in the conference of young scientists, specialists, interns, researchers and undergraduates from Urgench State University, and also from universities of the republic Central Asia Countries was envisaged. During the conference, in addition to sectional and plenary reports, the following discussions were organized:

World Women in Mathematics: Bakhyt Alipova,

International Information Technology University and Muhabbat Rakhimbayeva, Urgench State University, in particular, made a presentation on the TV (Uzbekistan).

Professor Lyudmila Alexeyeva (Kazakhstan) and Baltaeva Umida, Khorezm Mamun Academy (Uzbekistan), as well as, at the Institute of Mathematics, Professor Fatima T.Adilova reported on her results. Thanks to the scientific conference, senior researchers, undergraduates, as well as faculty members of many universities of Uzbekistan had the opportunity to establish contacts with representatives of various scientific schools from different regions. Guests from the other countries noted the high level of results obtained by scientists of Uzbekistan and suggested close cooperation in several areas of the modern theory of math models, statistics and differential equations.

7. Workshop: Inspire Young Girls to Appreciate Mathematics; Mathematics the tool; Mathematics the indispensable tool for Science and Technology, Ethiopia, Addis Ababa from 6 to 12 December, 2018

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Supported Activity Details:

African Women in Mathematics Association workshop

- Number of attendees: 91
- Number of women attendees: 65
- List of countries represented :11

Algeria [4], Burkina Faso [1], Côte d'Ivoire [1], Egypt [1], Ethiopia [76], Ghana [1], Kenya [2], Morocco [2], Nigeria [1], Sudan [1], Zimbabwe [1].

Report on the activity:

In the line of the title of the workshop, “Inspiring girls to appreciate the field of mathematics; mathematics the indispensable tool in science and technology”, several lectures on women and mathematics were organised. The opening ceremony was chaired by the Minister of Science and Higher Education, Dr. Hirut Woldemariam (a lady). Dr. Ambassador Genet Zewdie (former Minister of Education in Ethiopia, and also the first female minister of the country) talked on “ Ethiopian Girls’ education on STEM”. She presented kind of how Ethiopian girls’ education progressed from the “No, you are a girl, you can’t take a course in math” kind of approach to “ Let’s inspire girls to the fields of Math and Science”, even if still there is a need to do a lot.

Dr. Ambassador Gennet shared her accumulated knowledge and experience as she passed from a student in the emperor’s time to a minister of education-ambassador of Ethiopia to India, and now retired but still fighting for girls’ right to math and science education and more. Mrs. Asegedech Shawl talked on the topic: “Students’ Attitudes towards Female Mathematics Teachers; Lessons From my experience”. She talked about her own experience when placed to teach mathematics right after her graduation (BSc. In mathematics) at some High school in Eritrea.

Dr Marie Françoise Ouedraogo gave a talk to advertise on AWMA. She explained the objectives of the association and the different activities that have taken place so far. Prof. El Yacoubi, the President of the African Mathematical Union (AMU) presented briefly AMU and its commission “Women and Mathematics” AMUCWMA.

A round-table hold in the second day of the meeting with two subjects: the first subject focused on information on the operation of AWMA, the difficulties to set up a General Assembly and the renewal of the officers of AWMA due to funding issues to bring enough members to the meeting to reach the quota of elections. The second subject was a discussion and information to set up the Ethiopian Women in Mathematics Association.

The “Queen of Mathematics” award was also the nucleus of the program that really was in symphony with the theme of the workshop. Two girls, the best of the best five female grade 12 students and the best of the best five female grade 8 students were awarded the “Queen of Mathematics” prize at the end of the second (last) day of the conference.

There were some invited lectures by Prof. Schehrazad Selmane, University of Science and Technology Houari Boumediene, Algeria, Dr Entisar Alrasheed (University of Bahri - College of computer science and mathematics –Sudan), Prof. F. Z. Nouri (Laboratoire de Modélisation Mathématique et Simulation Numérique Université Badji Mokhtar, Annaba, Algeria), Prof. Senelani Hove-Musekwa (PADDONHURST, Bulawayo, Zimbabwe), Mahmoud Abdel-Aty (Zewail City of Sciences and Technology 6th October, Giza, Egypt).

There were also seven contributed talks.

Conclusions and recommendations:

In the level of Ethiopian women mathematicians, they are planning to

- Create the Ethiopian Women in Mathematics Association
- Continue with the “Queen of Mathematics project by picking the best two girls from the whole country (one from 8th grade and one from 12th grade) every year and award them
- Initiate diverse activities like summer camps, visit to female students in remote area, introduce little incentives to create interest in those who believe that they are not meant to be mathematicians or to do mathematics at all.

In the level of AWMA, the next workshop will be held in Cameroon in July 2019.

8. Activities of Indian Women and Mathematics (India)

Contact information: Prof. Riddhi Shah, JNU, New Delhi

Official website: <https://sites.google.com/site/iwmmath>.

Supported Activity Details:

a) The IWM Annual conference, held at Shiv Nadar University, National Capital Region, during 21-23 June, 2018 (CWM support was used for funding 7 women participants from the neighbouring SAARC country Nepal); Total number of participants – 85; Women participants- 70.

b) IWM Regional Workshops at

- NISER (National Institute for Science Education and Research, Bhubaneswar) 27-28 October 2018 with around 120 participants.

- HBCSE (Homi Bhabha Centre for Science & Education, Mumbai) 16-17 February, 2019. (CWM funds used for publicity and tea sessions)

c) Visitors Programme: Five women mathematicians gave/ will be giving talks at different Universities across India under this programme. CWM support of about 50 euros each was used as a partial support for this visitor programme.

Report on activity:

Indian Women and Mathematics (IWM) is a collective of Indian mathematicians that has been in existence since 2009. Our objective is to encourage more women to pursue higher education in mathematics, and to organize events and networking opportunities that will enable them to take up careers in mathematics. At the behest of the National Board for Higher Mathematics (NBHM), Government of India, IWM was reorganized in 2015, with the aim to scale up its activities and increase its reach. Currently, IWM’s National Executive Committee, chaired by Professor Riddhi Shah from the Jawaharlal Nehru University, Delhi has 13 members from various reputed universities and institutes of India. More information

about the IWMs past and recent activities is available on <https://sites.google.com/site/iwmmath/>.

The **IWM Annual Conferences** and **regional workshops** aim to bring together women students, college and university teachers and early-career researchers with mathematicians, especially women mathematicians not just from India but internationally, working at the frontiers of mathematics, to exchange mathematical ideas and share their experiences. A major goal of these events is to enable junior women mathematicians to interact with their senior colleagues, both individually and in small groups, as well as to present their own work. To this end, in addition to the invited talks, there are sessions featuring contributed talks, and a poster session. Advanced Ph.D. students and early-career researchers are encouraged to give a contributed talk or present a poster. Participation is not restricted to women only. The **Visitor Programme** of IWM envisages inviting established women mathematicians 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.

CWM grants are usually used for the above mentioned IWM activities to supplement the support received from NBHM (National Board for Higher Mathematics, India) and funds from host institutions.

Report of Academic Activities

In 2018-19, CWM supported some of the IWM activities by making a total grant of 3000 Euros. The details of each of the activities are as follows:

IWM Annual conference

The 2018 Annual Conference was held at Shiv Nadar University, in the National Capital Region, during June 21-23. It was sponsored by the National Board for Higher Mathematics. Significant financial support was also received from the Committee for Women in Mathematics (CWM) of the International Mathematical Union. **The CWM support enabled us to reach out to neighbouring countries and, for the first time, the conference had a delegation of 6 women mathematicians from Nepal.** The total number of registered participants in the conference was **85 with 70 women**. These came from all parts of India.

The program of the conference featured **4 plenary talks, 4 invited talks, 4 talks by young mathematicians, 12 contributed talks, a poster session, and a mini-course on knot theory.** There was also a **panel discussion** on *“Indian Women and Mathematics-looking behind and the road ahead”*.

The **Scientific Committee** of the conference consisted of Gautam Bharali (Indian Institute of Science), Priyanka Grover (Shiv Nadar University), Amber Habib (Shiv Nadar University), Riddhi Shah (Jawaharlal Nehru University), Sachi Srivastava (University of Delhi), and Geetha Venkataraman (Ambedkar University Delhi). Further information about the conference is available here <https://sites.google.com/snu.edu.in/iwm2018/home>.

Regional Workshops

- a) **NISER (National Institute for Science Education and Research) Bhubaneswar** hosted the **Regional Workshop: Research and Opportunities** on 27 and 28th October. The workshop was supported by NBHM (National Board for Higher Mathematics) and CWM and attended by nearly **120 participants** mostly from the eastern part of India. The one and a half day workshop featured seven lectures by invited speakers, a panel discussion on career opportunities and a poster session. More information about this workshop may be found here <http://www.niser.ac.in/IWM>.
- b) The next Indian Women in Mathematics **Regional Workshop on Research & Opportunities** will be held at the **Homi Bhabha Centre for Science & Education, Mumbai** on February 16&17, 2019. This event will also be partially supported by CWM. More information about this workshop may be found here <https://iwm.hbcse.tifr.res.in>.

Visitors Programme

Prof. Radha Kessar from **City, University of London, United Kingdom** visited India in August 2018 and gave the following talks:

- **August 17, 2018: University of Delhi, South Campus, Title of talk:** *Local structure and representations of finite groups*
- **August 20, 2018: Punjabi University, Patiala, Title of talk:** *Local structure and representations of finite groups*
- **August 21, 2018: Panjab University, Chandigarh, Title of talk:** *Finiteness conjectures in block theory*

Prof. Rukmini Dey from the **International Centre for Theoretical Sciences, Bengaluru** delivered the following talks under this programme.

- **December 15, 2018: Government College for Women, Thiruvananthapuram, Title of talk:** *What are minimal surfaces?*
- **January 21, 2019: Bethune College, Kolkata, Titles of talks:** (a) *The great legacy of Emmy Noether and Sofia Kovalevskaya* (b) *On minimal surfaces*
- **February 12, 2019: Mount Carmel College, Bengaluru, Titles of talks:** (a) *The great legacy of Emmy Noether and Sofia Kovalevskaya* (b) *The geometry of soap films: minimal surfaces*

Prof. Swatee Naik, from the **University of Nevada and NSF, United States of America**, gave a series of talks under the Visitor Programme in January 2019. The details are as follows.

- **January 2, 2019: Sardar Patel University, Anand (Gujarat), Title of talk:** *Topology: a study of shapes*

- **January 7, 2019: CHM College, Mumbai**, Title of talk: *Topology: a study of shapes*
- **January 9, 2019: Abeda Inamdar College, Pune**, Title of talk: *Topology: a study of shapes*

Prof. Indira Chatterji from the **University of Nice, France** is scheduled to give three lectures at Gwalior, Lucknow and Delhi in February 2019 as part of the Visitor Programme.

- **February 18, 2019: Jawaharlal Nehru University, New Delhi**, Title of talk: *The geometry of groups*
- **February 20, 2019: Jiwaji University, Gwalior**, Title of talk: *The geometry of groups*
- **February 26, 2019: Lucknow University**, Title of talk: *The geometry of groups*

Prof. Nikita Agarwal from the Indian Institute of Science Education and Research, Bhopal is scheduled to give three talks at Bhopal, Sehore and Ujjain in March 2019.

Other Activities

A discussion session titled *Women in Mathematics: Then and Now* with Prof. Dona Strauss from the University of Leeds was held on 17th November 2018. As a woman who began a research career in Mathematics in the early 1950's and is active till date, Prof. Strauss gave the participants some valuable insights.

Conclusions and recommendations:

This year, due to the support provided by CWM, we were able to reach out to not only women mathematicians in India, but also to women in mathematics from SAARC countries. Some mathematicians from Nepal participated in our annual conference held in June 2018 at Shiv Nadar University (SNU), Uttar Pradesh, India. With continued support, it would be possible to increase participation from SAARC nations and to build a strong network of women mathematicians in this region. The feedback from our activities over the last three years has been very positive and has prompted us to introduce a new activity for the coming year – the Young Women in Mathematics Workshop. CWM support will be vital in providing travel support to participants from SAARC nation for this activity as well as for the IWM Annual conference.

SCHOOL AND WORKSHOP

9. Summer School in Dynamical Systems, ICTP (International Centre for Theoretical Physics) (Trieste, ITALY)

Official webpage: <http://indico.ictp.it/event/8325/>

Contact Information:

Directors and School Lecturers:

Jana Rodriguez-Hertz (Southern University of Science and Technology, Shenzhen, China),

Corinna Ulcigrai (University of Bristol – currently at the University of Zürich),

Amie Wilkinson (University of Chicago),

Local Organiser: **Stefano Luzzatto** (ICTP)

Supported Activity Details:

Number of attendees: 127 Week 1, 150 in Week 2 (23 additional)

Number of women attendees: in 45 Week 1 (35%), in 52 in Week 2 (7 additional)

Participants from **50 countries.**

List of Countries represented: Algeria, Armenia, Belgium, Benin, Bolivia, Brazil, Canada, Cameroon, Chile, China, Colombia, Costa Rica, Croatia, Cyprus, Egypt, France, Georgia, Ghana, Hungary, India, Indonesia, Iran, Israel, Italy, Korea, Macedonia, Malaysia, Mexico, Nigeria, Pakistan, Peru, Poland, Portugal, Russia, Senegal, Serbia, Spain, Sweden, Thailand, Togo, Trinidad & Tobago, Tunisia, Uganda, Ukraine, UK, USA, Uruguay, Uzbekistan, Vietnam.

A special feature of the school was that directors and school lecturers were all women. It was also a regular ICTP school, with male and female students.

A short report on activities about women in mathematics:

During the two weeks of the School, a number of **Afternoon/Evening Activities** (between 4.30pm-6pm approximately) were organized in order to facilitate networking and in order to mentor, support and encourage participants pursuing mathematical research (at a PhD level

and beyond) and possibly an academic career. While only one of these events was explicitly targeted to “*female and gender minorities participants only*”, we believe that these activities are important to support all young participants, but benefit in particular female participants, who often lack confidence and particularly benefit from mentoring, role models and encouragement.

In addition to an **ice-breaking activity** the first day (which involved all participants, tutors and lecturers in “getting to know each other” games organized by the tutors) and a **poster presentation** (discussed in the next page with the academic activities), the following were organized:

- **Small Group Discussion/Networking session for women and gender minorities:** the participants were randomly assigned to one of three tables, each with two moderators (school directors, female tutors and ICTP postdocs) and asked to introduce themselves and then discuss on the “table topic”. Participants were shuffled so that each would sit at all three tables. Table topics were: *Cultural differences in gender perception in Academia*, *Encouraging women to pursue a career in science* and *Criteria for scientific evaluation* (see additional material).
- Two **Panel Discussions**, one the first week focused Master and PhD students, one the second week focused on junior researchers (postdocs and above). The topics were respectively:
 1. *Week 1 Panel Discussion:* Part I “**How to be a happy and successful PhD student**”
Part 2 “**The nuts and the bolts of applying for jobs**”
Panelists: Shah Faisal (ICTP Diploma student), Irene Pasquinelli (f, PhD student/school tutor), Davide Ravotti (PhD student/school tutor), Jana Rodriguez-Hertz (f, school director), Stefano Luzzatto (ICTP scientist/local organizer), *Moderator:* Oliver Butterly (School Tutor)
 2. *Week 2 Panel Discussion:* Part I “**How to become and independent researcher?**”
Part II “**Life (and family) and research balance**”
Panelists: Victoria Cantoral Farfán (f, ICTP postdoc), Khadim War (school tutor & former ICTP diploma student), Corinna Ulcigrai (School director), Raul Ures (mathematics professor and husband of school director), Amie Rodriguez Hertz (f, school director) *Moderator:* Davide Ravotti (School Tutor)
- Both panels had a similar format: initially the panelists shared their “top advice” on the topic, then answered questions from the audience. A virtual pad for asking questions anonymously, in advance and during the event, was set up (follow *link in the first page*)
- **Presentation of OWSD:** Tonya Blowers (OWSD Programme Coordinator) and Jana Rodriguez-Hertz (school director and Vice-President for the Latin America & Caribbean region of OWSD) presented the aims and activities of the **Organization for Women in Science for the Developing World** with particular focus on opportunities for participants. The event was attended mostly by female (but also some male) participants. The importance of networking and visibility was stressed in Jana Rodriguez-Hertz address.
- **Information Fair:** This was an informal evening reception followed by dinner which offered further opportunities for discussion. To facilitate exchange of information, the organisers asked each participant to describe their “*expertise*” areas (using symbols from a

previously designed). “Categories” included e.g. “has experience with 2 body problem, has children, applied for postdocs, served on a hiring/grant committee, ...).

A short report of academic activities:

The School was articulated over two weeks. Most participants attended both. The *first* more introductory *week* was designed to introduce some basic but fundamental ideas in dynamics (using “the circle” as a common denominator, from here the school subtitle “*a circle of methods in dynamics*”).

The *second week* courses introduced more advanced material and key concepts in the modern theory of dynamical systems, close to the areas of research expertise of the course directors. The Afternoon/Evening activities were very well received by the participants and helped create a welcoming and supporting environment, which was beneficial to all, but in particular to female younger participants.

(who were also the main lecturers).

One support course on introductory material in ergodic theory the first week (and some lectures in week 2) were taught during the first week by the School Tutors (Oliver Butterly, Irene Pasquinelli, Davide Ravotti, Lucia Simonelli, all PhD students or postdocs working in the field of dynamical systems).

Videos of Lectures: All lectures were recorded and streamed on the ICTP Dynamics Facebook page.

<https://www.facebook.com/DynamicalSystemsICTP/>

Recordings are available on the ICTP You Tube Channel

https://www.youtube.com/playlist?list=PLLq_gUfXAnkmlNq27K_vVgJaXdUljEQuT

Tutorial and Exercise Sessions: A key component of the School consisted of Tutorial and Exercise Classes. These were daily sessions (2pm-4pm) where all participants were gathered to work (alone or in groups) under the supervision of tutors and school directors. Problems were assigned daily by the lectures during the session (two per course, one easier to absorb basic notions and one more challenging). Tutors and lecturers were available to walk around the room and discuss with students. A large and consistent group of participants was very active and worked very hard, trying to solve the questions; the atmosphere created was very productive.

Tutors played an essential role in these sessions. The *Tutor Team* consisted of Oliver Butterley (ICTP, Trieste), Irene Pasquinelli (Durham University, U.K), Davide Ravotti (University of Bristol, U.K.), Lucia Simonelli (ICTP) and Khadim War (Ruhr-Universität, Bochum, Germany).

Poster Session: At the beginning of the second week (Monday 23 July 2018) an opportunity was given to all participants to present a poster on their research interests (presenting research results or possibly, for younger participants, some interesting topics they learned). The session was very well attended and all participants stayed and discussed for much longer than the allotted time.

Conclusions and recommendations:

The school was very successful: with more than 400 applications (it would be interesting to know if having 3 female directors/lecturers played a role in this), out of which 150 participants were selected. Therefore, the pool of participants was very strong, but also very varied, with participants from 50 countries, ranging from exceptional undergraduate and master students, all way through Ph.D. students, postdocs and young researchers. The number of female participants was high (around one third of the total) but perhaps not as high as hoped for. Thanks to the travel fellowships supported by the CWM funds, r targeted support to a number of strong female participants from developing countries was offered thus guaranteeing them the possibility to participate in the school.

Organizers, tutors and participants all shared excitement and satisfaction in way the event unfolded. Feedback from participants indicated that both the scientific content and the exercise sessions were in general well received. Comments include e.g. *“this Summer School really allowed us to apply what we learned in the courses given in the morning, because the exercises were done with the help of researchers in the afternoon.”*, or *“the level of lectures wasn't neither too high nor too low. The atmosphere was great, .. everyone was really nice, accessible and easy to talk to”*.

The school program included a quite intense and varied program of complementary evening activities, which included panels and group discussions and networking, some specifically for women and gender minorities. This is perhaps a quite novel and distinctive feature of the school. These were in some sense an “experiment”, so it was interesting to see how they went. The event for “women and gender minorities only” was perhaps the only one which generated some critical comments (e.g. *“the event should have had a corresponding event for men. .. it seemed to suggest that the issue of increasing gender diversity was the responsibility of the underrepresented class.”*). The panel sessions on the other hand were perhaps the most useful and well received event (some comments from participants: *“I think that both panels were also really great, it's great to here personal experiences from other people in academics who had success in their career.”* *“Career Panel was a new thing. It showed me that many people have similar problems with scientific career, but there are ways to solve them.”*).

Organizing these type of sessions was relatively easy, since the panellists were from “internal resources” (formed out of school directors, school tutors and ICTP staff) and the format is simple to reproduce. Offering at least one or two mentoring sessions of this nature in *every* school is a highly recommended activity, which benefits all participants, but seems especially crucial to encourage and support young female mathematicians.

10 “Matemáticas en el Cono Sur” (Workshop in Uruguay) , 3 to 7 December Montevideo, Uruguay.

Contact information for the CWM:

Eugenia Ellis: eellis@fing.edu.uy

Conference Webpage: <https://www.fing.edu.uy/~eellis/mcs/>

Supported activity details

There were 39 participants (**26 women**) from the following countries:

Argentina (17), Brasil (2), Colombia (4), Chile (3), United States (1), Uruguay (11) and Venezuela (1).

The organizing committee was composed of: Eugenia Ellis (Instituto de Matemática y Estadística Rafael Laguardia, Facultad de Ingeniería, Universidad de la República, Uruguay) and Andrea Solotar (Universidad de Buenos Aires, Argentina)

A special feature of the worksop was that organizers were all women. It was also a regular workshop, with male and female participants.

Report on activity:

The main activity of this workshop was research in Mathematics. Every day from 9 a.m. to 5 p.m. the teams (which had already had skype meetings) worked on the proposed activity. On Monday the research problems of each group have been presented --the activity was open to the entire mathematical community. On Friday the advances made during the week were described in 30 minutes' talks.

Gender activities

Two round tables were held:

1 Round table about *Women in STEM*: Institutional answers about gender gap in academia. *Tuesday 18:00.*

Panelists: Beatriz Garat (Pediciba, Uruguay), Ximena Usher (ANII, Uruguay), Cecilia Fernández (CSIC, Uruguay), Gabriela Marin (Universidad de Costa Rica), Alicia Dickenstein (Universidad de Buenos Aires).

This activity was coorganized with the Project: Breaking down barriers – for more women in the STEM areas.

1 Round table about *Gender gap: Women in Mathematics*. *Thursday 19:00.*

Panelists: Maria Isabel Cortez (Universidad de Santiago de Chile), Betul Tanbay (Bogazici University), Alicia Dickenstein (Universidad de Buenos Aires), Rejoyce Ghavi (African Institute for Mathematical Sciences).

This activity –coorganized with IMAGINARY- was aimed to general audience and approximately 200 persons attended the round table.

Conclusions and Recommendations

1. The first and rather obvious conclusion was that is important to reinforce the existing networks among women mathematicians in Latin America.
2. All the participants have appreciated participating in a meeting of this kind, and most of them commented about the good atmosphere for work. Even the men participating in these groups with female mathematicians as leaders have been very well integrated.
3. The organisers have been asked by most of the participants to organize a new meeting of this type in two years. This request comes from the fact that the event was filling a gap in the mathematical activities in the region: that is, having conferences with a

gender perspective but focused in the scientific activities. This helps strengthening research networks.

PROJECTS

11. Portraits of Women Mathematicians from Africa

Contact Information:

Schehrazad SELMANE scselmane@yahoo.fr

Report on activity

The aim of this activity was to highlight women mathematicians in Africa and further to provide role models for school girls and young women in their early stages in the field of mathematics. To this end, a questionnaire was sent to all African women granted by Open Arms travel grants to attend (WM)² and ICM 2018 in Rio de Janeiro, Brazil, and also to other African women mathematicians through the mailing list of AWMA. After reviewing all received portraits, nineteen were kept, and a booklet was designed. The thirty printed samples have been distributed during (WM)² to women featured in the booklet and also to some presidents of associations present at the event.

The CWM funding was received on November 2018. The production of the AWMA posters, AWMA flyers, and the booklet was then achieved. These documents will be distributed during AWMA meetings.

A poster of the nineteen role models included in the booklet has been realized and presented during (WM)² in Rio de Janeiro, Brazil.

Conclusions and recommendations:

The organisers are confident that this first portrait gallery of African mathematician women, enriched with positive messages of the elders, will be an inspiration to many school girl scholars and those already in the universities who will get the chance to read it. The organisers will do their best for widespread dissemination in Africa. They are very hopeful when inspiring statements by women featured in this booklet are read a better future for women in the field of mathematics is foreseen. Other African mathematician women will be invited to share their stories and experiences with us for future booklets. A series of booklets will be produced, and in addition to English, women will be invited to write their portrait in their own language.

Contact Information: Eugenie Hunsicker, Chair of the London Maths Society Women in Maths Committee and Irina Linke, film maker

Report on activity:

A short film for International Women's Day 2018, Faces of Women in Mathematics, was proposed by Eugenie Hunsicker, Chair of the London Maths Society Women in Maths Committee, and Irina Linke, a filmmaker. It consists of an edited sequence of film clips of women saying into the camera "I am (name) from (country), and I am a mathematician!" in the language of their choice. The 146 clips, sent in as a result of a message circulated to CWM ambassadors (see below), featured 243 women mathematicians from 36 different countries speaking in 31 different languages. CWM used a small part of its budget for editing the clips and the film has been greatly appreciated by all who have seen it. See <https://vimeo.com/259039018>. There are about 34700 views of the film and also more than 300 followers on the Facebook page.