

# CDC Panel and Poster Session: Strengthening Mathematics in the Developing World

18:00-19:15 Panel Discussion

19:15-20:00 Poster Session

CDC Panel and Poster Committee:

Mama Foupouagnigni

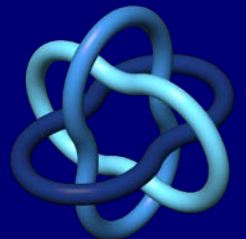
Lena Koch

Angel Pineda (Chair)

Polly Sy

- Additional information including digital resources:  
[www.mathunion.org/cdc/icm/cdc-panel-discussion-and-poster-session-during-icm-2018](http://www.mathunion.org/cdc/icm/cdc-panel-discussion-and-poster-session-during-icm-2018)

- Contact email for questions:  
[cdc.grants@mathunion.org](mailto:cdc.grants@mathunion.org)



# Panel

## Moderator:

- IMU CDC (Angel Pineda)

## Panelists:

- IMU-CDC President (Wandera Ogana)
- IMU-CWM Chair (Marie-Françoise Roy)
- MPS Director, Simons Foundation (Yuri Tschinkel)
- BMS President (Paolo Piccione)
- SEAMS President (Jose Maria Balmaceda)
- AMU President (Nouzha El Yacoubi)
- UMALCA Secretary (Alejandro Jofre)

# Poster Session

In addition to the organizations represented in the panel, the following organizations are also represented:

- African Institute for Mathematical Sciences (AIMS)
- African Mathematics Millennium Science Initiative (AMMSI)
- Centre International de Mathématiques Pures et Appliquées (CIMPA)
- European Mathematical Society Committee for Developing Countries (EMS-CDC)
- Heidelberg Laureate Forum
- International Centre for Theoretical Physics (ICTP)
- International Commission on Mathematical Instruction (ICMI)
- International Science Programme (ISP), Uppsala University
- London Mathematical Society (LMS)
- Research in Germany

# Activities in Developing Countries: CDC , ICMU and CIEC



Presented at the CDC Panel at ICM2018  
by  
Wandera Ogana, President CDC



# Commission for Developing Countries (CDC)

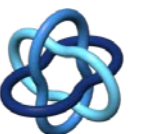
IMU GA 2010: The Commission on Development and Exchanges (CDE) and the Developing Countries Strategy Group (DCSG) were merged into the **Commission for Developing Countries (CDC)**, with a mandate

**“To manage all initiatives of the IMU in support of mathematics in developing and economically disadvantaged countries”.**

## IMU Definition: Developing Countries

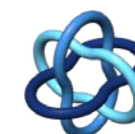
In 2015 IMU EC resolved (after a proposal by CDC) to raise the limit of the gross national income (GNI) of a country to USD 11,000 (from previously USD 7,500) in order to define Developing Countries.

It was also agreed that this limit should be redefined every 4 years within the cycles of the ICMs.



# Members of CDC from 2011

	<b>CDC 2011-2014</b>	<b>CDC 2015-2018</b>
CDC President	José-Antonio de la Peña (Mexico)	Wandera Ogana (Kenya)
CDC Secretary for Policy	C. Herbert Clemens (USA)	Olga Gil Medrano (Spain) since 1.1.2016 C. Herbert Clemens (USA) 1.1.2015-31.10.2015
CDC Secretary for Grant Selection	Srinivasan Kesavan (India)	Srinivasan Kesavan (India)
African Member	Wandera Ogana (Kenya)	Mama Foupouagnigni (Cameroon)
Asian Member	Hoang Xuan Phu (Vietnam)	Polly Sy (Philippines)
Latin American Member	Carlos Cabrelli (Argentina)	Alf Onshuus (Colombia)
CDC member appointed by the IMU EC	Ragni Piene (Norway)	Budi Nurani Ruchjana (Indonesia)
CDC member appointed by the IMU EC	Polly W. Sy (Philippines) -	Angel Pineda (USA/Honduras)
CDC member appointed by the ICMI EC	Angel Ruiz (Costa Rica)	Angel Ruiz (Costa Rica)
IMU President and Ex-officio CDC Member	Ingrid Daubechies (USA)	Shigefumi Mori (Japan)



# CDC activities during 2014 - 2017

**(a) Conference Support Program:** Gives partial support to conferences organized in developing and economically disadvantaged countries. The Program also supports a few major international conferences occurring in developed countries. The maximum amount is €3,500.

**(b) Project Support Program:** Supports capacity building projects and activities in mathematics and mathematics education, be they international, regional or local initiatives in developing countries.



**(c) Lecturing and Mentoring:** CDC runs two lecturing and mentoring programs:

**The Volunteer Lecturer Program (VLP)** is offering universities in the developing world lecturers for intensive 3-4 week courses in mathematics at the advanced undergraduate or master's level. Funding for the Volunteer is provided by CDC. The program receives support by the American Mathematical Society (AMS).

During 2014-2017 a total of 34 courses in 16 countries were supported.





**African Diaspora Mathematicians Program (ADMP)** offers partnerships between African Diaspora mathematicians and Mathematics academic units at any university in Africa. Initially, the Program is run as a pilot program in Africa for two years (May 2017 - June 2019) and involves a total of three partnerships (Ethiopia, Cameroon, Zimbabwe).

**Plan is to extend it to other regions of developing countries, depending on success of the pilot program**



**(d) Individual Research Visits:** Between 2014 and 2017 ran three programs supporting research visits which are designed for postdoctoral mathematicians.

**Abel Visiting Scholar Program (since 2013)** - Thirteen (13) fellowships were granted in the period 2014 - 2017.

**b) IMU-Simons African Fellowship Program (2016-2021)** - During the interval 1<sup>st</sup> September 2016– 31st December 2017, 18 mathematicians were selected.

**c) IMU-Simons Travel Fellowship Program (2014-2017)** - During the interval 09/2013- 05/2017 the total amount of €49,562 was granted to 32 scholars.



**(e) Graduate Support Programs:** The CDC offers two scholarship schemes to support graduate studies (MSc or PhD) in a developing country in the mathematical sciences.

**IMU Breakout Graduate Fellowship Program** (since 2016) is funded by the generous donations of the winners of the Breakthrough Prizes in Mathematics. In 2016 three students (from Botswana, Colombia and Vietnam) were awarded.

**Graduate Research Assistantships in Developing Countries Program (GRAID)** (since 2017) is for Research Assistantships for graduate (MSc or PhD) –students of emerging research groups working in a developing country listed in Priority 1 or 2 of the IMU CDC Definition of Developing Countries. The GRAID Program is funded by voluntary donations from mathematicians or mathematical institutions worldwide. In 2017, two research groups were selected for support, one in Cameroon and the other in Morocco.



**(f) Other Activities and Programs:** The CDC has had the following other activities during 2014 to 2018:

**Library Assistance Scheme** - CDC offers limited financial support for shipment costs for individual scientists or institutions wishing to donate books in the mathematical sciences to libraries in developing countries.



**MENAO (2014) and CDC Panel and Poster Session 2018**

In 2014, the IMU CDC organized a day-long symposium prior to the opening of the ICM2014 in Seoul, Korea entitled *Mathematics in Emerging Nations: Achievements and Opportunities* (MENAO). During the ICM CDC also organized three NANUM Networking with NANUM grantees.

In 2017 CDC started to organize a panel discussion and poster session on Strengthening Mathematics in the Developing World to be held on August 7, 2018 in Rio.

**Reports on mathematics research and graduate education in emerging nations** - CDC members and regional partners prepared in 2013 and 2014 three reports about the current state of mathematics in Africa, Asia and Latin America and on opportunities for new initiatives to support mathematical development. The reports were made available in August 2014 at the MENAO Symposium.

**CDC Website** - In the 2017 a new CDC website was launched (together with the new IMU website) and new online forms and databases were developed. The new website replaced the CDC website which was launched in 2012. The CDC website is hosted by WIAS Berlin.



CDC's principal source of 'core' income is an annual grant from the International Mathematical Union (IMU). IMU in turn receives its financial support from IMU member countries.

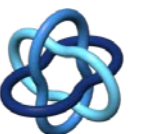
Additionally CDC has received financial support from a number of organizations and individual mathematicians.

Furthermore, CDC has many volunteers who dedicate their time to support CDC activities

The Commission for Developing Countries would like to express its profound thanks to all institutions and individuals supporting CDC and its activities.

CDC is looking forward to future collaboration with all its supporters, cooperation partners and volunteers.

**More information about CDC and its activities can be found on the website: [www.mathunion.org/CDC](http://www.mathunion.org/CDC)**



# International Commission on Mathematical Instruction (ICMI)

**Founding:** ICMI was founded in 1908 and has been a commission of IMU since 1952

**Representatives:** ICMI representatives are contact persons in ICMI member countries (currently 98)

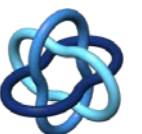
## **Purposes:**

- (1) To promote international programs of activities and publications that improve the collaboration, exchange and dissemination of ideas and information on all aspects of the theory and practice of contemporary mathematical education.
- (2) To foster efforts to improve the quality of mathematics teaching and learning worldwide.
- (3) To support and assist the International Congress on Mathematical Education (ICME) and meetings or conferences of ICMI affiliated organizations.



# Activities of ICMI

- (a) ICME:** The major responsibility of ICMI is to plan and organise the quadrennial International Congress on Mathematical Education (ICME). This Congress is attended by many mathematicians from developing countries.
- (b) CANP:** ICMI organises the Capacity and Network Project (CANP) whose aim is to provide teacher educators in developing countries with enhanced mathematical expertise.



**(c) The Klein Project:** This is an IMU/ICMI project that began in 2008 with the aim of producing mathematics resources for secondary school teachers on contemporary mathematics.

**(d) ICMI Regional Conferences:** ICMI lends its name to regional meetings on mathematics education, particularly in developing countries.

### **ICMI EXECUTIVE COMMITTEE: 2017 - 2020**

- [Jill Adler, President](#)
- [Merrilyn Goos, Vice President](#)
- [Luis Radford, Vice President](#)
- [Abraham Arcavi, Secretary General](#)
- [Jean-Luc Dorier, Member-at-large](#)
- [Zahra Gooya, Member-at-large](#)
- [Anita Rampal, Member-at-large](#)
- [Yuriko Yamamoto Baldin, Member-at-large](#)
- [Binyan Xu, Member-at-large](#)
- [Shigefumi Mori, Ex officio Member \(IMU President\)](#)
- [Helge Holden, Ex officio Member \(IMU Secretary\)](#)
- [Alicia Dickenstein, ICMI-IMU Liaison \(elected by the IMU EC\)](#)
- [Ferdinando Arzarello, Ex officio Member \(ICMI President 2013-2016\)](#)

**More information about ICMI and its activities can be found on the website: [www.mathunion.org/ICMI](http://www.mathunion.org/ICMI)**





# Committee on Electronic Information and Communication (CEIC)

**Formation:** CEIC is a Standing Committee of the IMU-EC formed in 1998 to advise the EC on how trends on the effects of electronic information and communication on society in general and mathematicians in particular.

**Mandate:** The following is the mandate of CEIC

- (a) To **advise** the IMU on aspects of its operations related to information and communication, including technical, legal and financial implications, and keep it informed of new developments.
- (b) To **review** the development of electronic information, communication, publication, instruction, and archiving so as to keep the IMU abreast of current and emerging issues.
- (c) To **advise** the IMU about potential opportunities to endorse standards and articulate best practice recommendations on issues related to the field, as well as potential opportunities to foster the growth and development of electronic infrastructure.



# Committee Members

[James Davenport](#), University of Bath, UK (2008-2018), *CHAIR*

[Thierry Bouche](#), Université de Grenoble I, France (2011-2018)

[Tim Cole](#), University of Illinois at Urbana-Champaign, USA (2013-2020)

[Patrick Ion](#), Mathematical Reviews, USA (2015-2018)

[Alf Onshuus](#), Universidad de los Andes, Colombia (2017-2020)

[Victoria Stodden](#), University of Illinois at Urbana-Champaign, USA (2015-2018)

[Masakazu Suzuki](#), Kyushu University, Japan (2015-2018)

[Ravi Vakil](#), Stanford University, USA (2011-2018)

IMU EC liaison: [Ingrid Daubechies](#), Duke University (2015-2018)

## Activities

**(a) Publications:** Over the years, CEIC has produced a number of publications which address the mandate given by EC

**(b) Activities at ICM:** CEIC has undertaken the following activities at ICMs

(i) ICM2010: Roundtable on “The Use of Metrics in Evaluating Research”

(ii) ICM2014: Organised 3 panels

**More information about CEIC and its activities can be found on the website: [www.mathunion.org/CEIC](http://www.mathunion.org/CEIC)**

# Thank you very much!

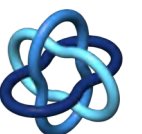


# CDC Panel/Poster Session Strengthening Mathematics in the Developing World

- Presentation of the IMU Committee for Women in Mathematics Activities
- Marie-Françoise Roy, chair of CWM



[www.mathunion.org/cwm](http://www.mathunion.org/cwm)



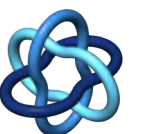


# Committee for Women in Mathematics

The only international structure for women in mathematics created by the EC in March 2015

## **TERMS OF REFERENCE**

- (1) To promote international contacts between national and regional organizations for women in mathematical sciences;
- (2) To maintain the Women in Mathematics pages on the IMU website
- (3) To organize an electronic community of women mathematicians
- (4) To work with groups, committees and commissions of IMU on topics pertaining to women mathematicians and their representation;
- (5) To publicise and suggest, working practices that ensure equal opportunities for women mathematician
- (6) To report annually to the EC and propose actions

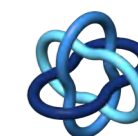




# Committee for Women in Mathematics



CDC Panel/Poster Session on Strengthening Mathematics in the Developing World





## Committee for Women in Mathematics

### CWM WEBSITE

Unique and important function as the only platform coordinating such diverse worldwide activity.

Initiated by Ingrid Daubechies

Launched before CWM at the Seoul ICM

Items (events, new women in maths organisations, newsworthy items, resources etc) added every week

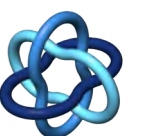
36 countries listed with some form of organisation

### CWM AMBASSADORS

A network of 120 women (and supporters) in 76 countries

Disseminate information from CWM

Circulate information about initiatives.





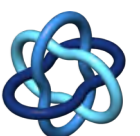
## Committee for Women in Mathematics

### ACTIVITIES FUNDED BY CWM : NETWORKS

*Annual call* for supporting the *networks* of female mathematicians on a regional basis in developing or emerging countries.

In 2016-2018 : over 150 applications, 29 funded, amounts up to 3 K euro each

2017 : Brazil, Canada (Mathematical Congress of the Americas), Morocco, Chile, India, Nepal, Tunisia, South Africa, Iran, Vietnam, Mexico, Japan  
1500 participants in total in 2016-2017





Committee for Women in Mathematics



Committee for Women in Mathematics







## Committee for Women in Mathematics

### ACTIVITIES FUNDED BY CWM : OTHER EXAMPLES

Short film *Faces of Women in Mathematics*

(Eugenie Hunsicker, Chair of the LMS Women in Maths Committee, Irina Linke, filmmaker).

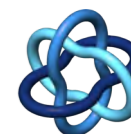
Sequence of film clips of women saying

"I am (name) from (country), and I am a mathematician!"  
in the language of their choice.

146 clips featured 243 women mathematicians

36 different countries speaking in 31 different languages.

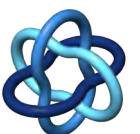
See <https://vimeo.com/259039018>.



# Faces of Women in Mathematics



CDC Panel/Poster Session on Strengthening Mathematics in the Developing World





## Committee for Women in Mathematics

### **GENDER GAP IN SCIENCE PROJECT**

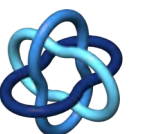
Major project: 100K euros per year 2017-19, 11 partners\*  
IMU lead union, funded by International Council of Science

**Aims :** to produce sound data to support the choices of interventions that ICS and its member unions can feasibly undertake to reduce the gender gap  
Focus on developing countries

**Survey of Scientists:** Open until October 31st 2018

<https://gender-gap-in-science.org/>

\* IMU, IUPAC, IUPAP, ICIAM, IAU, IUBS, ACM, IUHPST, UNESCO, OWSD, GenderInSite



# Global Survey of Scientists

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Welcome to the Global Survey of Scientists. [To take the survey in English, click here.](#)

Bienvenue dans l'enquête mondiale destinée aux scientifiques. [Pour répondre aux questions de l'enquête en français, veuillez cliquer ici.](#)

欢迎参加全球科学工作者调查。[要使用中文参加本调查, 请单击此处.](#)

科学者向けグローバルアンケートにようこそ。[日本語のアンケートに回答するには、ここをクリックします.](#)

Приветствуем Вас в Глобальном опросе ученых. [Чтобы пройти опрос на русском языке, нажмите здесь.](#)

Bienvenido/a a la Encuesta mundial de científicos y científicas. [Para hacer la encuesta en español, haga clic aquí.](#)

[مرحبًا بك في الاستبيان العالمي للعلماء للمشاركة في الاستبيان باللغة العربية، انقر هنا.](#)



# **WORLD MEETING FOR WOMEN IN MATHEMATICS**

On July 31 2018

Satellite event of ICM

>350 participants, >1/3 from Open Arms

Latin American focus

Including a Memorial to Maryam Mirzakhani

World Premiere of the first part of the film

**JOURNEYS OF WOMEN IN MATHEMATICS**



## Committee for Women in Mathematics

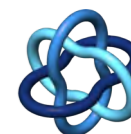
### JOURNEYS OF WOMEN IN MATHEMATICS

Film created by CWM, filmed and edited by Micro-Documentaries, made possible by a grant from the Simons Foundation.

Neela Nataraj (India) , Aminatou Pecha (Cameroon) and Carolina Araujo (Brazil) featured in their home countries and a group of six women from various Latin American countries interviewed at (WM)<sup>2</sup> .

Documents both the successes and barriers for women in mathematics, in the words of the women themselves.

First version premiered at (WM)<sup>2</sup> <https://youtu.be/tphQ0eRim4w> , final version after summer.





**Neela Nataraj**  
Head of the Department  
(HOD) of Mathematics  
Indian Institute of Technology,  
Bombay



**Aminatou Pecha Njiahou**  
Researcher, Professor  
Maroua University



**Carolina Araujo**  
Full Researcher  
Institute for Pure and  
Applied Mathematics  
(IMPA)

## Journeys of Women in Mathematics



Committee for  
Women in Mathematics

This film was created by the IMU Committee for Women in Mathematics

Filmed and edited by Micro-Documentaries

Made possible by a grant from the Simons Foundation

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## Committee for Women in Mathematics

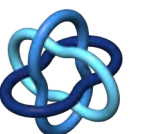
### MARYAM MIRZAKHANI MEMORIAL

Created at the initiative of CWM by Thais Jardim and Rafael Meireles Barroso.

Situated in a corner on the ground floor of Pavillon 2 (close to the posters area).

Contains an exhibiton of 15 original posters, with two books with all the papers of Maryam Mirzakhani as well as a book with papers about her.

Book of condolences at the disposal of ICM attendees to write their thoughts and feelings about Maryam Mirzakhani.





Mary Mir  
Marya Mi  
Maryam M  
Maryami Mirzakhani Memorial  
Maryam M  
Marya Mi  
Mary Mir  
Mar Mirz

SIMONS FOUNDATION

# OVERVIEW

SF was founded by Jim and Marilyn Simons in 1984.

- 2007: SFARI (Autism Research)
- 2009: MPS
- 2013: Life Sciences
- 2013: Simons Center for Data Analysis (SCDA)
- 2014: Outreach and Education
  - Math for America (since 2004)
  - Quanta Magazine
- 2015: Center for Computational Astronomy (CCA)
- 2015: SCDA  $\Rightarrow$  Center for Computational Biology (CCB)
- 2016: Flatiron Institute
- 2017: Center for Computational Quantum Materials (CCQ)

# MPS: FUNDING CATEGORIES

- Grants to Individuals
  - Simons Investigators (US, Canada, UK, and Ireland)
  - Simons Fellows (US and Canada)
  - Targeted Grants in MPS (e.g., Simons Observatory)
- Simons Collaborations
- Grants to Institutes
- Conferences
- Infrastructure (Magma, ArXiv)

## 12 Collaborations in steady state

4+3 years, about 10 PIs/collaboration, 2-2.5M/year/collaboration

- Algorithms and Geometry
- Homological Mirror Symmetry
- Special Holonomy
- Arithmetic geometry, number theory, and computation
- Nonlinear waves

# GRANTS TO INSTITUTES

MPS currently supports 29 institutes in 18 countries, e.g.,

- Simons Institute for the Theory of Computing (Berkeley)
- MSRI, IHES, KITP
- Aspen Center for Physics, Oberwolfach, Vietnam Academy of Science and Technology
- Mandelstam Institute for Theoretical Physics at the University of the Witwatersrand
- TATA (Bangalore), Banach Center of the Polish Academy
- ICTP
- IMU-CDC
- EMS-CDC

# AFRICA MATHEMATICS PROJECT

- Université des Sciences et Techniques de Masuku, Gabon
- Botswana International University of Science and Technology
- Université Cheikh Anta Diop de Dakar, Senegal



Welcome



# sbm

The Brazilian Mathematical Society () is a non-profit professional association founded in 1969 to promote mathematics in Brazil. It serves the national and international community of mathematicians through publications, meetings, competitions and other programs and activities.



# publications

Documenting and wide-spreading  
mathematics across Brazil  
and the world.

**SBM** publishes and distributes  
journals and books in Portuguese and  
English. It also provides a distribution channel  
for other organizations such as IMPA (Instituto  
de Matemática Pura e Aplicada) at a national  
level.



## ➤ SBM Book Collections

- Fronteiras da Matemática
- Textos Universitários
- Professor de Matemática
- Matemática Aplicada
- Iniciação Científica
- Olimpíadas de Matemática
- Matemática para o Ensino
- História da Matemática

## ➤ SBM Journals

- Bulletin of the Brazilian Mathematical Society
- Matemática Contemporânea
- Ensaios Matemáticos
- Matemática Universitária
- Eureka!
- Revista do Professor de Matemática
- Professor de Matemática On-line

## ➤ IMPA Book Collections

- Projeto Euclides
- Matemática Universitária
- Matemática e Aplicações

## ➤ Selected Works of Brazilian Mathematicians



SBM has an agreement with Springer-Verlag for the publication of the selected research papers of renowned Brazilian mathematicians. Among them, are worth mentioning:

- Manfredo do Carmo
- Jacob Pallis
- Djairo Figueiredo
- Ricardo Mañé



# programs

Teaching Mathematics

**SBM** runs several initiatives to support and improve mathematical education at all levels.

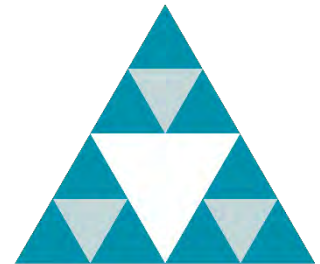


## ➤ Proformat

Is a master's degree program for school teachers, the most important of these initiatives.

In the nationwide network PROFMAT takes 1,800 new students every year, in about 100 campuses in all Brazilian states.

- 75 associated institutions
- 96 cities
- over 3,900 graduates



**PROFMAT**

# meetings

Scaling -up knowledge through  
exchange

## ① Periodic National Meetings

The **SBM** organizes periodic meetings to encourage interest in mathematics at all levels in a national scope.

- Bienal da Matemática
- Colóquios de Matemática das Regiões

## ② International joint Meetings

SBM stimulates international cooperation and exchange attending, sponsoring or hosting international gatherings of mathematicians.



# prizes and awards

Empowering high-end Mathematics

**SBM** encourages research and investigation in the mathematical field recognizing the most brilliant works and efforts.





## Prizes and awards

### ① SBM Prize

It rewards the best original research paper in mathematics published in the last three years by a young mathematician working in Brazil. It is awarded in biennially, during the Brazilian Mathematics Colloquium, by a five-member international committee whose judgement is based on originality, relevance, depth and potential impact in the field.

### ① IMPA-SBM Journalism Prize

Stimulates print media publications on Mathematics, Science and Technology.

### ① SBMAC Prize

Awards young students' papers on undergraduate research projects.

### ① Gutierrez Prize

It selects the best doctoral thesis in Mathematics for the current year.



# outreach activities

Awareness and appreciation of Mathematics  
as a broad phenomenon

**SBM** promotes the community  
interest in Mathematics as collective  
experiences.



## ① Biennium of Mathematics 2017-2018

Series of activities aiming at disseminating and popularizing mathematics throughout the whole society: children and their families, students and teachers.



## ① Math Olympiads (OBM)

The Brazilian Mathematical Olympiad (OBM) was founded by the SBM in 1978 and involves about 500,000 students every year, from 6th grade to the undergraduate level.



## ① Math's Festival 2017

This fair-type event offered a wide range of activities, from lectures and exhibits to workshops and games, designed for all audiences. It attracted more than 18,000 visitors in four days.



## ④ Brazilian Math Olympiad for Schools (OBMEP)

The OBMEP is a national project targeting Brazilian public and private schools, organized by the National Institute of Pure and Applied Mathematics (IMPA), with the support of the Brazilian Society of Mathematics (SBM) and promoted with resources from the Brazilian Ministry of Education and the Ministry of Science, Technology, Innovation and Communications - MCTIC.

- 18.2 million students enrolled
- 5,545 Brazilian municipalities
- 576 gold medals
- 1,727 silver medals
- 5,178 bronze medals
- 44,386 honorary mentions





Thank you!



# STRENGTHENING MATHEMATICS IN THE DEVELOPING WORLD : FOCUS ON SOUTHEAST ASIA

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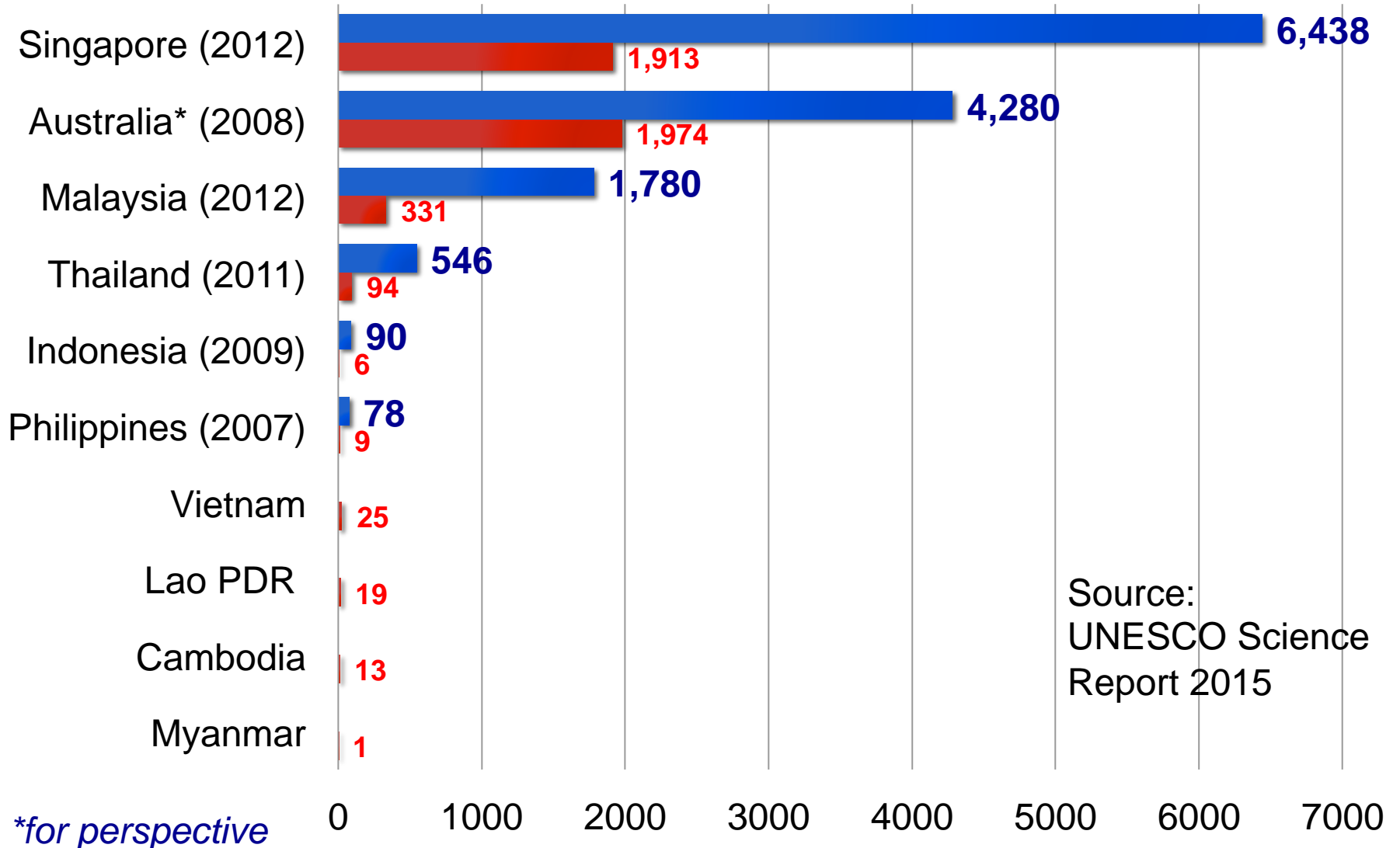


# SOUTHEAST ASIA

- Region's socio-economic, cultural and geographic diversity poses many challenges.
- Includes Singapore and Hong Kong, but also Myanmar, Laos and Cambodia – and the mathematical needs span the full range from most basic to the most advanced.
- Any developmental activity should begin with a clear understanding of context (individual histories, culture, tradition, resources, priorities, etc).



■ Researchers per million (closest year)  
■ Publications per million (2014)



Source:  
UNESCO Science  
Report 2015



- Even in mid-tier countries like Indonesia, Philippines and Vietnam, poverty, lack of basic infrastructure and competent teachers are huge obstacles.
- Big goal is not to transform cramped classrooms into high-tech ones but to empower countries to develop mathematics that is relevant to the socio-cultural needs of their people.
- Developed countries also contend with several issues, such as low satisfaction and negative attitudes of students towards math, including widespread anxiety especially with national exams.



# SOUTHEAST ASIAN MATHEMATICAL SOCIETY (SEAMS)

founded 1972

## MEMBER-SOCIETIES

- Singapore Math Soc\* (1952)
- Vietnamese Math Soc\* (1966)
- Malaysian Math Sci Soc\* (1970)
- Math Soc of the Philippines\* (1973)
- Indonesia Math Soc\* (1976)
- Math Assoc of Thailand\* (1978)
- Hong Kong Math Soc\* (1979)
- Cambodian Math Soc\*\* (2005)
- Math Soc of Myanmar (2013)
- Nepal Math Soc\*\* (affiliate member)

\*IMU member

\*\*IMU associate member

- Regional societies facilitate collaboration and exchanges
- Regional members face many common challenges, often with common root causes
- Solutions and best practices are shared – “South-South” cooperation
  - ✓ Example: do graduate studies in universities within the region. Costs are often lower, culture-shock is lessened

# Activities in the region

## SEAMS

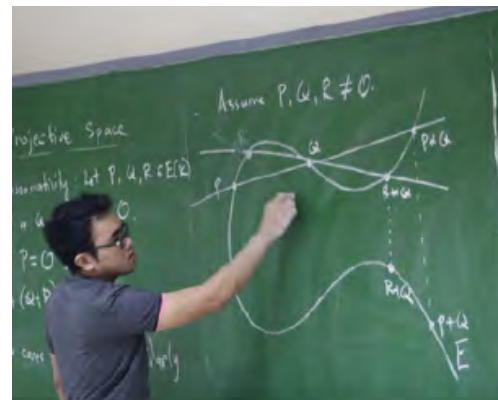
- Asian Mathematical Conference every 4-5 years (Vietnam 2020)
- Involvement in regional/ bilateral partnerships
- Establishment of and support to national math societies (e.g. Cambodia, Myanmar; next: Laos, Brunei)
- Publishes the journal Southeast Asian Bulletin of Mathematics

## Common Activities of Individual Member-Societies

- Conferences, workshops on math and math education
- Local/national math olympiads and IMO teams
- Popularization of math, teacher-training (basic and higher ed)
- Publication of journals (research and popular)
- Education initiatives and reform (e.g. new K-12 basic education in the Philippines)

**SEAMS Schools** (since 2010) are 7 to 10 day intensive study programs for advanced undergraduates and master's students in the region.

- inspired by EMALCA program in Latin America.
- partially supported by CIMPA

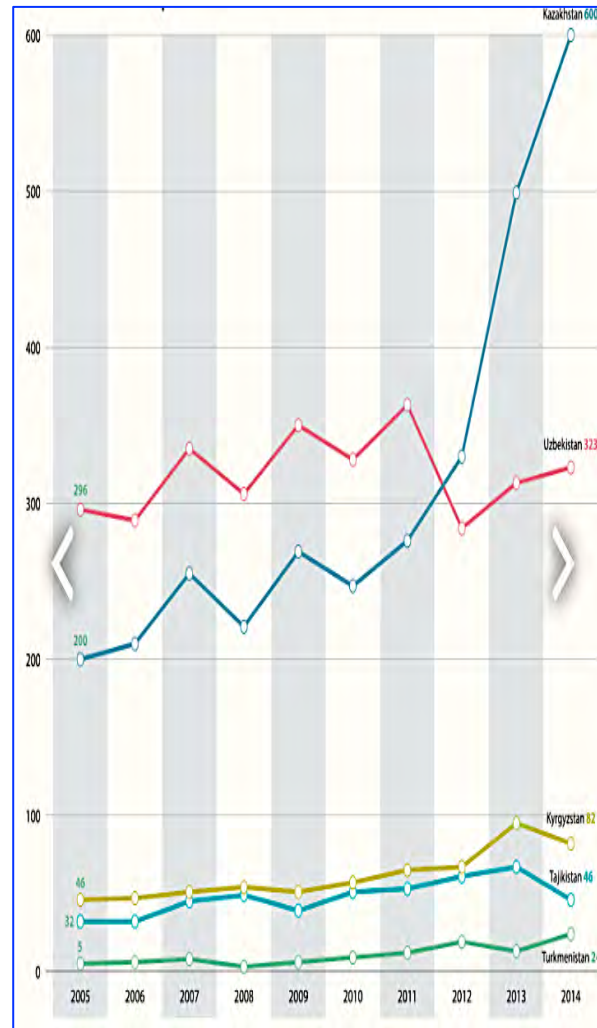


- Lecturers come mainly from host and region (less costly)
- Encourages women and students from less-developed countries

# India and Central Asia

- **India** has more than a dozen mathematical societies, with the Indian Mathematical Society as oldest (1907)
- **Central Asia:** Kazakhstan, Uzbekistan, Tajikistan, Turkmenistan, Kyrgyzstan
- Unevenness in the mathematical growth and levels (from country to country, and across regions in India)

Source:  
UNESCO Science Report 2015



Kazakhstan  
600 (in 2014)

Uzbekistan  
323

Kyrgyzstan  
82

Tajikistan  
46

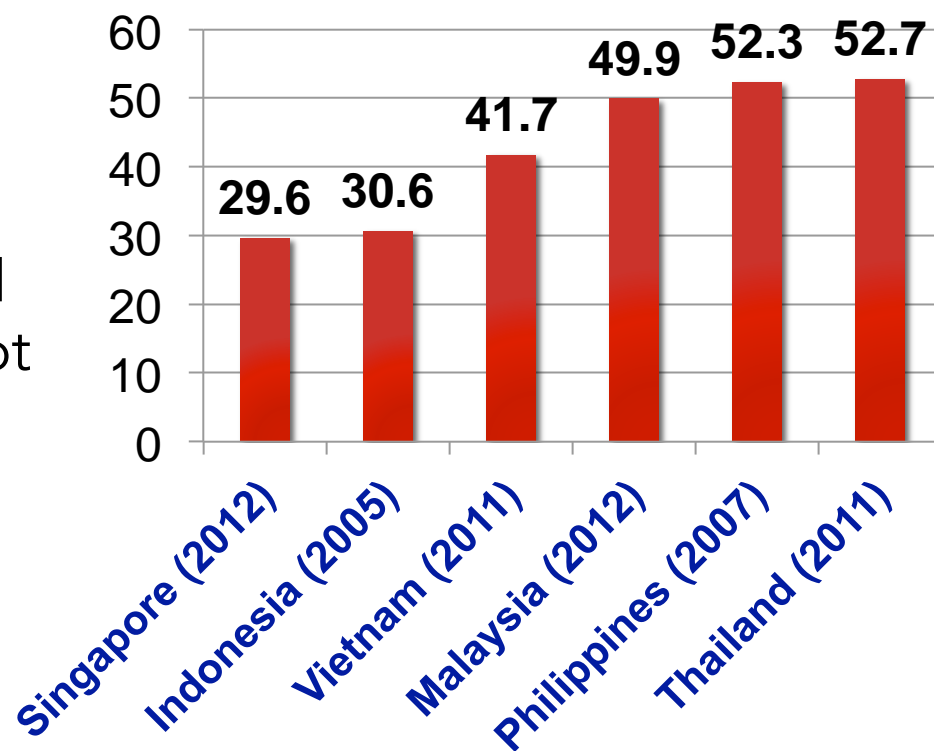
Turkmenistan  
24

**Growth of Scientific Publications 2005-2014**

# Some thoughts and wishes

- ✓ Good partnerships are based on mutual respect and appreciation of differences, leading to self-reliance for the less-developed partner
- ✓ ICT can be a game-changer and MOOCs can be effective, but not in places where electricity and connectivity are still major problems
- ✓ Offer more opportunities for women and the poor, including indigenous peoples (local culture is also a rich source of math)

## % Women researchers



Source:  
UNESCO Science Report 2015



- ✓ Encourage “PhD Sandwich-programs” (cheaper, often a deterrent to brain-drain)
- ✓ Provide opportunities for research visits and post-doc experience, possibly within the region
- ✓ Raise more awareness and campaign against insidious practices like predatory journals or conferences that often victimize those from less developed countries

Maraming Salamat. Thank you for listening!

# ICM 2018 / CDC Panel

## Strengthening Mathematics in the developing world

7<sup>th</sup> August 2018, Rio De Janeiro, Brazil

challenges of African Mathematical Union  
in strengthening Mathematics in Africa

[www.africamathunion.org](http://www.africamathunion.org)

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# ICM 2018 / CDC Panel: challenges of African Mathematical Union in strengthening Mathematics in Africa.

## INTRODUCTION

“More than forty years after the creation of the African Mathematical Union with a mission, statutes and objectives designed according to the various impediments, challenges, opportunities, etc...of the moment, our responsibility for this new mandate (2017-2021) is to define a new vision consisting on redesigned goals with an improved and better adapted strategy for a relevant strengthening and a fruitful development of Mathematics in Africa, to meet the requirements and expectations of this new millennium”. These words were on the top of my address in the new AMU website : [www.africamathunion.org](http://www.africamathunion.org)

## ICM 2018 / CDC Panel: challenges of African Mathematical Union in strengthening Mathematics in Africa.

❖ the African Mathematical Union (AMU) was founded during the first Pan African Congress of Mathematicians, in Rabat, Morocco in July 1976.

□ With mission :

○ To Coordinate and promote the quality of teaching, research and outreach activities in all areas of mathematical sciences throughout Africa. Advancing mathematical research and education includes efforts and contributions towards the economic, social and cultural development of the continent.

□ For the achievement of such mission the following actions have been undertaken:



- In 1978, the AMU Executive Committee created the AMU Journal: **Afrika Matematika**, initially with the aim to make mathematical research originating within Africa more widely known.
- Since 2011, Afrika Matematika has been published by Springer. The submission rate has been growing since that date and it has truly increased in the last couple of years.
- Since 2013, the improved status of the journal was evidenced by the fact that it has been listed by Scopus.
- In December 2018: for the first time PACOM 2017 Proceedings will be published in a special issue of Afrika Matematika.

## ICM 2018 / CDC Panel: challenges of African Mathematical Union in strengthening Mathematics in Africa.

➤ In 1986, four AMU Commissions were established:

1. For Mathematics Education in Africa
2. For Pan African Mathematics Olympiads
3. For History of Mathematics in Africa
4. For African Women in Mathematics

➤ In 2009, the AMU Commission for Research and Innovation in Mathematical Sciences was added.

### AMU MAIN ACTIVITIES

The more important AMU scientific event is : **Pan African Congress of Mathematicians (PACOM)**

UNDER THE HIGH PATRONAGE OF HIS MAJESTY KING MOHAMMED VI



جامعة محمد الخامس  
Université Mohammed V de Rabat



Mohammed V University in Rabat  
and  
the African Mathematical Union  
organize

The 9<sup>th</sup> Panafrikan  
Congress of  
Mathematicians

**PACOM**

July 3 - 7, 2017

Rabat, Faculty of Sciences

And

The 25<sup>th</sup> Panafrikan  
Mathematics  
Olympiade

**PAMO**

July 1 - 6, 2017

Rabat, Teachers Training  
School



On the theme

Mathematics on the Heart of Technological  
Innovation and Economic Development of Africa

Partners



Faculté des Sciences



Académie  
Hassan II  
des Sciences  
& Technologies



Institut National de Recherche  
Scientifique et Industrielle (INSI)



جامعة محمد الخامس  
Université Mohammed V de Rabat

Sponsors



## ICM 2018 / CDC Panel: challenges of African Mathematical Union in strengthening Mathematics in Africa.

### New vision for the mandate 2017-2021 : AMU to be

- **federator with full commitment (data base of African mathematical association, societies, NGO)**
- **Innovative : by developing maths that can impact critical sectors of the economy; collaborating with the Business and Industry world and adhering to ICIAM, Math-in, etc....by creating AfricaMath-In.**
- **New workshops STIMATH. 1<sup>st</sup> ed. STIMATH 2018**

BIUST

1st AMU-CAWM International Workshop  
on STI and MATHEMATICS

**STIMATH 2018**

“The role of African Women in Mathematics in  
addressing challenges in STI in Africa”

First announcement  
22-23 November 2018,  
BIUST, Botswana

**AMU-CAWM MEMBERS :**

Pr. Eunice Mureithi, (Tanzania.)  
Dr. Nkamba Leontine, (Cameroon)  
Pr. Naha El Khattabi, (Morocco)  
Pr. Jojo Zingiswa (South Africa);  
Pr. Gadine-Joseph Olubunmi (Nigeria);  
Pr. Ancille Ngendakumana (Burundi)  
Pr. Kgomotso Garegae (Botswana.);  
Pr. Yirgaalem Tsegaye (Ethiopia);



African Mathematical Union

# ICM 2018 / CDC Panel: challenges of African Mathematical Union in strengthening Mathematics in Africa.

## AMU ACTIONS UNDERTAKEN SINCE July 2017

- ❑ New AMU website available
- ❑ Data base of African Mathematical associations, societies, foundations, NGO
- ❑ Revision Committee of the AMU Statutes and Internal Regulations
- ❑ First draft of the global agenda and planning of the AMU activities



Year	Date	Event	venue	Date	Event	Venue
2018	23-30/06	PAMO 18	Nairobi	August	PAMORET	Abuja
	24-25/09	EC meet.	Rabat	5-9 /11	CPDFA	Ouga
	22-23/11	STIMATH	BIUST	Dec.	ICACC	Dakar
2019	April	3 <sup>rd</sup> PAMS	Luanda	May	PAMO 19	TBA
	26-29/06	ICHM	Abidjan	7-12/07	43th PME	Pretoria
2020	TBA	CAGA	Brazza	TBA	WACGAAT	Niger
	TBA	PAMO20	Tunis	24-26/06	4thPAMS	Rwanda

AFRICAN MATHEMATICAL SCHOOLS (AMS/EMA) in collaboration with CIMPA (7 to be held in 2018) EMA 2019 are in selection TBA.EMA 2020 Application will be launched.



UMALCA

MATH UNION  
LATIN AMERICA & THE CARIBBEAN  
1995 -

# Programs



- EMALCAS Schools
- Travel Grants
- CLAM, UMALCA prize

# EMALCAS Schools



- The goal is to put in contact college students in locations with few access to main stream mathematics and mathematicians
- Started in 1998, are running every year. Several schools per year.
- Teachers are prestigious research mathematicians
- Sponsors: CIMPA (Regular sponsor), IMU's CDE, MCA, TWA-Trieste (in process)

# EMALCAS Schools



- Schools 2018: Guatemala, El Salvador, Argentina, Venezuela, Cuba, Mexico.
- Schools 2017: Colombia, Argentina, Ecuador, Venezuela, Bolivia y Mexico
- Schools 2016: Chile, Mexico, Dominican Republic, Venezuela
- Schools 2015: Argentina, Bolivia, Mexico, Nicaragua, Peru, Venezuela

# Travel grants

- Support for research visits or for attending conferences within the Latin America region
- It is allocated mostly on young researchers and postdocs

# CLAM Conferences



- CLAM: region-wide meeting, modelled on ICM, organized every 4 years
- Past meetings: 2000 Rio de Janeiro, Brazil; 2004 Cancun, Mexico; 2009 Santiago de Chile, Chile; 2012 Cordoba, Argentina; 2016: Barranquilla, Colombia
- Next meeting: 2020 Montevideo, Uruguay

# UMALCA Prize



- 2016: Henrique Bursztyn, Robert, Morris (Brazil); Andres Navas (Chile); Pablo Shmerkin (Argentina)
- 2012 Fernando Codá Marques (Brazil)
- 2009 Alejandro Maass, Universidad de Chile, Carlos Gustavo Moreira (Brazil) Federico Rodriguez Hertz (Uruguay)
- 2004 Enrique R. Pujals (Brazil)
- 2000 Marcelo Viana (Brazil)



# UMALCA: Mathematics



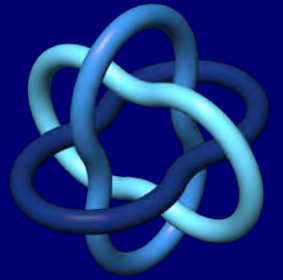
- Increasing quality of mathematics produced in UMALCA's countries
- Increasing community of mathematicians
- A network of Centers of Excellence in Mathematics, including CNRS Math UMI in Chile, Brazil, Mexico, Argentina...
- Strong international network
- A variety of involvements in applications: country and regional cooperation
- Energy, mining, forestry, environment, natural catastrophes, etc.

# UMALCA: Mathematics



- Examples of other programs: MathAmsud and SticAmsud
- Main conference organized by UMALCA members
- Stronger PhD and Postdocs programs
- Prizes: several including a Field medal
- MCA
- UMALCA connected with the main associations in other latitudes
- ICM 2018 !!

# Thank you for your attention



## Please proceed to the poster session just outside of the room.

CDC Panel and Poster Committee:

Mama Foupouagnigni

Lena Koch

Angel Pineda (Chair)

Polly Sy

