November 3, 2019

The 12th International Conference on Mathematics and
Mathematics Education in Developing Countries
National University of Laos NUOL

Panel Meeting
"Strengthening Math and Math Education
in Developing Countries"

Chair: Michel Waldschmidt
Professeur Émérite, Sorbonne Université,
Institut de Mathématiques de Jussieu, Paris
http://www.imj-prg.fr/~michel.waldschmidt/

Program 60 minutes for 7 panelists, 8 minutes/person

- **Michel Waldschmidt and Stefano Luzzatto**
  *Experience of Europe in helping developing countries.
  Programs, opportunities by EMS CDC, IMU CDC*
- **Khin Myo Aye and Zaw Latt**
  *How the Myanmar Math Society was formed. Activities
  during the period of the 5 years of the conference in Myanmar*
- **Sri Wahyuni and Carlene Pilar**
  *Collaborating with foreign experts. Activities in Indonesia and
  Philippines. Efforts to promote math to women*
- **Chan Roath**
  *Working with government and how the education or science
  ministries can help*

CIMPA, ICTP

CIMPA
Centre International de
Mathématiques Pures et
Appliquées

https://www.cimpa.info/index.php

ICTP
International Centre for
Theoretical Physics

https://www.ictp.it/research/math.aspx

IHÉS, SEAMS

IHÉS
Institut des Hautes Études
Scientifiques

https://www.ihes.fr/

**South East Asian
Mathematical Society**
- SEAMS Schools

http://www.seams-math.org/

RNTA

Roman Number Theory Association

http://www.rnta.eu/

- WAMS School (West Asian Mathematical Schools)
- Nepal Algebra Project (Fields and Galois Theory "multiple hands" course in Nepal 2016 - 2021)

EMS

EMS
European Mathematical
Society

EMS Committee for Developing Countries
https://nickpgill.github.io/emscdc/
http://euro-math-soc.eu/committee/developing-countries

EMS CDC (Committee for Developing Countries)

https://nickpgill.github.io/emscdc/about

EMS CDC

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ERCE (Emerging Regional Centres of Excellence)

Pakistan, Mexico, Vietnam, Iran, Malaysia,
Benin, Botswana, Morocco, Indonesia

Information on the seven **Emerging Regional Centres of Excellence (ERCE)** centres is available in the links below.

- 2013-17: CIMAT I VIASM;
- 2014-18: IASBS I INSPEM;
- 2016-20: IMSP I UB I UCA I ITB.

About	Advantages	Criteria	How to apply

ERCE is a label of quality awarding those institutes that show an outstanding level in their own area of influence in research and education, being an attractor of students from other regions and countries. The label is granted for a period of 4 years with possibility of being renewed. The focus of this project is the education of students in the developed world to the Masters level and possibly PhD.

https://nickpgill.github.io/emscdc/about

EMS CDC ERCE

To train mathematicians from the least developed regions to say the Masters level, it is neither efficient nor necessary to send them to institutions of the highest level. Indeed among the emerging economical regions there are very good centres which can train mathematicians to the Masters level and higher. Indeed after obtaining a Master degree and equipped with strong background, the capable student can access any PhD program, within the region and beyond, say e.g. Europe.

Our successes so far have included, in collaboration with CIMPA, the education of Cambodian students in Vietnam to Masters level; as well as the education of Indonesian students in Pakistan, at the Abdus Salam School of Mathematical Sciences in Lahore.

It is important that institutes that play a central role in education at a regional level are supported in their activity. It is in this spirit that our committee has initiated a scheme of **Emerging Regional Centres of Excellence (ERCE)**. The idea is for EMS to select, endorse and help a number of such centres to offer training to M.Sc. level to students from less developed countries in their region. Following the above encouraging examples, provided there are institutions in the emerging economies who are interested in participating, and with the backing of the EMS, our committee is confident that such a scheme can reap dividends.

https://nickpgill.github.io/emscdc/about

EMS CDC ERCE

In sum, ERCE centres play a crucial role in the mathematical education and the development of quality and resources at a regional level. Indeed the scheme serves several goals at global, regional, and national level:
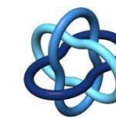
- the development of mathematical knowledge to Masters level;
- raising the number of mathematically qualified people with academic and industry perspective;
- increasing the visibility and prestige of the centre itself.

Thanks to this scheme, the ERCE centres provide education in less developed regions and will, in exchange, get help to further develop themselves. It looks to be a very advantageous scheme for all: at the same time, with relatively small expenditure a larger number of students can receive their first graduate education, in a culture not too removed from their own. This will be a practical and efficient way for mathematicians to help other mathematicians.

https://nickpgill.github.io/emscdc/about

IMU

IMU,
Commission for Developing
Countries (CDC)

https://www.mathunion.org/activities/commission-developing-countries-cdc

The CDC has the mandate to manage all initiatives of the IMU in support of mathematics in developing and economically disadvantaged countries.
Besides administering the Grants Programs for Mathematicians as well as the Volunteer Lecture Program, the CDC takes part in the following types of activities in accord with various aspects of its mission :

- Research
- Support of local initiatives
- Support of Educational and Local Capacity Building Programs
- Implementation of IMU member contribution programs destined for support of mathematics and mathematics teaching in developing countries.
- Exploration of funding and grant opportunities of new and existing sponsors.
- Development of proposals and joint activities with partner organizations.
- Identification of inexpensive and free online mathematics research resources and advertise these to mathematicians in the developing world.
- Service as a "clearing-house" for the activities of individual countries and mathematics societies in support of mathematicians in the developing world.
- Encouragement of proposals and support projects from mathematical organizations or individual mathematicians in the developing world

In order to pursue its mission CDC receives an annual grant from IMU.

IMU CDC

IMU
Commission for Developing
Countries (CDC)

The CDC is charged with the following missions :
- to manage, strengthen and promote the programs of the IMU in developing and economically disadvantaged countries.
- to search for funding to support the corresponding activities.
- to establish institutional partnerships with scientific organizations with common goals.

IMU Volunteer Lecturer Program

Two main objectives of the Volunteer Lecturer Program are :
1. to build capacity in mathematics and mathematics education in developing countries, and
2. to increase mathematical interaction between the mathematical community in the developed world and the vast, mostly untapped reservoir of mathematical talent in the developing world.

The Volunteer Lecturer Program offers universities in the developing world lecturers for intensive 3-4 week courses in mathematics at the advanced undergraduate or master's level. The funds for all living expenses, including travel (up to USD 5000 paid in EUR) are provided by IMU/ CDC or its supporting organizations (AMS, USNCM and Abel Board).

The course given by the volunteer should be part of a regular mathematics undergraduate or master degree program at the hosting university.

IMU Volunteer Lecturer Program

Breakout Graduate Fellowships

Support for postgraduate studies in a developing country, leading to a PhD degree in the mathematical sciences with duration of up to four years, for excellent students from developing countries.

Donation by the winners of the Breakthrough Prizes in Mathematics (Ian Agol, Jean Bourgain, Simon Donaldson, Christopher Hacon, Maxim Kontsevich, Vincent Lafforgue, Jacob Lurie, James McKernan, Terence Tao and Richard Taylor), IMU - with the assistance of FIMU (www.friends-imu.org) and TWAS (https://twas.org) - has now raised $ 900,000.

https://www.mathunion.org/cdc/scholarshipsgraduate-scholarships/
imu-breakout-graduate-fellowship-program

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https://www.mathunion.org/cdc/

IMU CDC (Commission for Developing Countries)

https://www.mathunion.org/cdc

IMU CDC

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IMU CDC VLP

https://www.mathunion.org/cdc/lecturing/volunteer-lecturer-program

Goals of the IMU VLP

- To build capacity in mathematics and mathematics education in developing countries

- To increase interaction between the mathematical community in the developed world and the mostly untapped mathematical talent in the developing world

Structure

- 3-4 week intensive courses at the upper undergraduate or master's level

- Substantial course enrollment (~ 20 students)

- Support in recruitment of students, scheduling and living arrangements for the volunteer from local host

- All financial costs of the volunteer are covered by the IMU

Graduate Assistantships in Developing Countries (GRAID)

From L-R Angel Pineda, Wandera Ogana, David Ssevviiri, Ingrid Daubechies, Edgar Tchoundja

Structure of GRAID

- The Principal Investigator (PI) and International Partner (IP) should be in regular contact and have an active collaboration.

- The PI is responsible for ensuring smooth sustained communication in the Team between, the graduate research assistants and the IP.

Requirements
- PI should live and work in a developing country listed in Priority 1 or 2 of the IMU CDC Definition of Developing Countries.
- IP should not live and work in a developing country listed in Priority 1 or 2 of the IMU CDC Definition of Developing Countries.

GRAID Support

Amount of Support:
- Up to USD 3,500 per student per year.
- Up to 3 graduate research assistantships per team.

Duration of the Support
- Up to 4 years for PhD students
- Up to 2 years for master's students

https://www.mathunion.org/cdc/scholarshipsgraduate-scholarships/
graduate-assistantships-developing-countries

Supported Teams

Cohort 1 (2017):
- Cameroon + USA (PI:Edgar Tchoundja, IP: Brett Wick)
- Morocco + Spain (PI: Driss Bennis, IP: Luis Oyonarte)

Cohort 2 (2018):
- Uganda + UK (PI: David Ssevviiri, IP: Michael Wemyss)

Cohort 3 (2019):
- Burkina Faso + France (PI: Idrissa Kabore, IP: Nicolas Bedaride)
- Pakistan + Germany (PI: Sarfraz Ahmad, IP: Volkmar Welke)

From L-R Keumo Adriel (student), Edgar Tchoundja (PI), Defo Hugues (student)

Call For Applications

Deadline: March 15, 2020

https://www.mathprograms.org/db/programs/480
Applications are encouraged!

Materials:
- Short CV of PI and IP
- Collaboration Proposal of PI and IP (3 pages or less) including:
  I. Vision and history of collaboration and student training
  II. Number of students to be supported
  III. Research plan
  IV. Itemized Budget
- Letter from the IP

Fundraising (Friends of the IMU)

- International Congress of Women Mathematicians (ICWM) 2014
- Donations from members of the American Mathematical Society (AMS) during membership renewals.
- One-time or recurring donations from individual mathematicians.
- Grassroots fundraising activities (i.e. RunForGRAID)

http://friends-imu.org/graid-donation/