

RUPP-Master of Mathematics & CIMPA

SEAMaN Workshop 8-10 June 2015

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Mission

In accordance with one of the recommendation expressed by UNESCO at its 18th General Conference, the mission of CIMPA is *the training of mathematicians coming primarily from developing countries, through internships during the academic year and summer schools, and in developing means of documentation.*

CIMPA schools (~ 20 each year), few in SouthEast Asia,
Only one in Laos 2014.

CIMPA-SEAMS schools (since 2008).

Doctoral and Master trainings.

Some other institutions include

ICTP (Italy) ▶ <http://www.ictp.it>

ISP (Sweden) ▶ <http://www.isp.uu.se>

IMU-CDC ▶ <http://www.mathunion.org/cdc/>

EMS-CDC ▶ <http://euro-math-soc.eu/EMS-CDC/>

International Center for Pure and Applied Mathematics



Salto Uruguay March 9-20 Hamiltonian and Lagrangian Dynamics	Cocle Panama October 19-28 Non-commutative Algebra	Mulzenberg South Africa July 19-31 Algebraic Representation Theory 2015
Santiago Chile April 6-17 Minimal surfaces, overdetermined problems and geometric analysis	Salta Argentina November 2-13 Center-Salta 2015: Dynamics on Cantor sets	Mombasa Kenya July 20-31 Mathematical Modeling and analysis of complex systems
Cabo Frio Brazil June 1-12 II Latin American School of Algebraic Geometry and Applications	Hamamet Tunisia March 20-29 Nonlinear Partial Differential Equations arising from Geometry and Physics	Ziguinchor Senegal December 5-16 Probabilistic models in epidemiology
Lima Peru May 25-June 5 Transformation Groups and Dynamics Systems	Marrakech Morocco April 13-24 Géométrie différentielle et algèbres non associatives	Mumbai India July 6-17 Summer School on Current Research in Finite Element Methods
Buenos Aires Argentina July 6-17 Random processes and optimal configurations in analysis	Djida Morocco May 18-29 Théorie des nombres et applications	Ispahan Iran August 24-Sep 4 Tilings and Tessellations
Cusco Peru August 8-22 Arithmetic, Groups and Analysis: Cusco 2015	Izmir Turkey June 29-July 12 Leavitt path algebras and graph C*-algebras	Daejeon South Korea May 25-June 3 Dynamical systems: Examples, billiards, and the 3-body problem
Sao Carlos Brazil August 25-Sep 4 New Interactions of Combinatorics and Probability		Ulaanbaatar Mongolia July 27-August 7 Stochastics Processes and Applications Mongolia 2015

CIMPA2015
Écoles de recherche
Research Schools

INTERNATIONAL CENTER FOR PURE AND APPLIED MATHEMATICS (CIMPA) is an international organization that promotes research and higher education in Mathematics in developing countries. CIMPA is sponsored by UNESCO through international cooperation in Education and Science (INESC) and the International Centre for Mathematical Sciences (ICMS) in Chengde and by the French Republic and the Argentine Republic of Buenos Aires. CIMPA is also supported by the French Republic and the Argentine Republic of Buenos Aires. CIMPA is also supported by the French Republic and the Argentine Republic of Buenos Aires.

<http://www.cimpa-icoam.org/>



International Center for Pure and Applied Mathematics

Santiago Chile January 11-22
Toric methods in Geometry, Arithmetics and Dynamics with ICTP

Merida / Guanajuato Mexico Feb 22-March 4
Moduli of Curves with ICTP

Mar del Plata Argentina March 7-18
Homological Methods, Representation Theory and Cluster Algebras

Solis Uruguay March 31-April 9
Hyperbolic groups and their representations

Santiago de Cuba Cuba June 8-17
Mathematical modeling in Biology and Medicine

Medellin Colombia June 13-24
Algebraic, Enumerative and Geometric Combinatorics ECCO 2016

Havana Cuba August 29-Sep 9
Mathematical Models for Security Applications

Nouakchott Mauritania Feb 15-26
Théorie Algorithmique des Nombres et Cryptographie

Abidjan Ivory Coast March 14-25
Géométrie et Analyse

Saint-Louis Sénégal April 5-15
Méthodes statistiques pour l'évaluation des risques extrêmes: Applications à l'Environnement, l'Alimentation et l'Assurance

Dakar Sénégal May 2-12
Analyse Géométrique des Formes Optimales (AGFO)

Nouakchott Mauritania June 12-24
Equations aux Dérivées Partielles et Calcul Scientifique

Antananarivo Madagascar July 11-21
Combinatoire et Algorithmique

Yaoundé Cameroon Sept 19-30
Modélisation Mathématique et Informatique en Epidémiologie, Ecologie et Agronomie

Quatre Bornes Mauritius Dec 5-16
Mathematical Models in Biology and Medicine

Nador Morocco May 9-21
Modélisation, Analyses mathématique et numérique pour les problèmes aux dérivées partielles

Tipaza Algeria May 22-June 4
Théorie des Nombres et Applications

Rabat Morocco July 10-20
Rational Homotopy Theory and its Interactions

Tunis Tunisia Oct 4-14
Mathématiques pour la Biologie

Kairouan Tunisia Nov 7-19
Théorie Spectrale des Graphes et des Variétés

Ho Chi Minh Vietnam August 1-12
Lattices and application to Cryptography and Coding theory with ICTP

Kolkata India Dec 1-12
On Geometric Flows

CIMPA2016
Écoles de recherche
Research Schools

INTERNATIONAL CENTER FOR PURE AND APPLIED MATHEMATICS (ICPAM) is an international organization that provides research and higher education in Mathematics in developing countries. CIMPA is sponsored by UNESCO and supported by numerous governments such as France, Spain, Belgium, the United Arab Emirates, Morocco, Egypt, and Tunisia.

International Center for Pure and Applied Mathematics

Combinatorics
<http://math.ac.vn/conference/seams15>
9-20 March 2015
Institute of Mathematics, VAST,
Hanoi, Vietnam
E-mail: IMH-Seams15@math.ac.vn
Organizer:
Phan Thi Ha Duong, Le Tuan Hoa,
Phung Ho Hai and
Nguyen Dong Yen

**Number Theory
and Applications
in Cryptography
and Coding Theory**
[www/math.uni-bielefeld.de/~dhoang/seams15/](http://www.math.uni-bielefeld.de/~dhoang/seams15/)
31 August - 8 September 2015
University of Science,
Vietnam National University
-HCMC, Vietnam
Organizer: Dung H. Duong
{dhoang}@math.uni-bielefeld.de

**Modeling
and
Simulation
for the
Environmental
Phenomena**
www.usd.ac.id/workshop/seams/
7-15 September 2015
Sanata Dharma University,
Yogyakarta, Indonesia
Organizer:
Sudi Mungkasi
{sudi@usd.ac.id}

**Some Aspects of
Representation
Theory**
seams-school2015.fmpa.ugm.ac.id
9-17 November 2015
Universitas Gadjah Mada,
Yogyakarta, Indonesia
Organizer:
Sri Wahyuni
{swahyuni@ugm.ac.id}

**Algebras and
their applications**
(Quantum physics, Cryptography and Statistics)
einspem.upm.edu.my/seams2015/
2-10 November, 2015
INSPEM, Universiti Putra Malaysia (UPM),
Kuala Lumpur, Malaysia
Organizer:
Dato' Kamel Ariffin Mohd Atan
{kamel@upm.edu.my}

Coding & Graph
www.unhas.ac.id/math/seams/
28 September - 6 October 2015
Universitas Hasanuddin,
Makassar, South Sulawesi
Indonesia
Organizer:
Nurdin Hinding
{nurdin1701@unhas.ac.id}

All SEAMS Schools
are sponsored by:

CIMPA

Master of Mathematics

Preliminary

How did this project start?

- 2003: Conference in Kunming (China),

Two Cambodian PhD holders: Dr Chan Porn & Dr Chan Roath.

Request the help of CIMPA to promote maths in Cambodia.

- 2004 Short visit: R.A.C.; R.U.P.P.; I.T.C.

Maths at RUPP: Bachelor (4 years) training for students to become teachers.

Project of CIMPA to organize a Master of Mathematics in Cambodia.

- 2005 Opening of the Master of Mathematics at R.A.C.

- 2006 ITC hosted the Master during 3 years.

Master of Mathematics

R.A.C. & R.U.P.P.

Two years: Master I & Master II. New generation every two years.
8 to 10 courses per year, each course lasts from 3 to 4 weeks.

In Master 2, the students have to write a thesis.

Requirements to get the Master diploma: 15 courses + Thesis.

R.A.C.	2005-07	1st generation	~ 35 students
R.U.P.P.	2007-08	"Pre-Master"	
R.U.P.P.	2008-10	2nd generation	22 students
R.U.P.P.	2009-11	3rd generation	11 students
R.U.P.P.	2011-13	4th generation	17 students (2 from NUOL)
R.U.P.P.	2013-15	5th generation	22 students
R.U.P.P.	2015-17	6th generation	12 students
			Total: about 120 students

Responsibles of the Master:

R.U.P.P.: Mam Mareth <http://www.rupp.edu.kh/master/mathematics/>

International : Prof. Brigitte Lucquin (University of Paris 6)
& Prof. Michel Jambu (University of Nice Sophia Antipolis).

Master of Mathematics

Master I 2014-15

Master I 2014-15

- 1 Numerical Analysis 1 (Seam Ngonn, RUPP)
- 2 Real Analysis (Maxime Zavidovique, Paris 6) September 29-October 24
- 3 Topology (Michel Jambu, Nice) November 24-December 31
- 4 Probability 1 (Pierre Arnoux, Marseille) January 5-23
- 5 Financial Mathematics (Thomas Lim, Evry) January 26-February 13
- 6 Advanced Algebra (Takayasu Kuwata, Tokyo) February 16-March 6
- 7 Differential Geometry (Naoyuki Ishimura, Tokyo) March 9-20 & June 1-5
- 8 Approximation of PDE 1 (Brigitte Lucquin, Paris 6) March 23-April 10
- 9 Algebra and Geometry (Michel Waldschmidt, Paris 6) April 20-May 8
- 10 Statistics 1 (Xavier Bressaud, Toulouse) May 12-30
- 11 ODE (Mark Gockenbach, Houghton, US) June 8-July 3

Master of Mathematics

Master II 2015-16

Master II 2015-16

- 1 Statistics II (Federica Giardina , Stockholm) 26 October-13 November
- 2 Applied Geometry (Michel Jambu, Nice) 23 November-31 December
- 3 Functional Analysis (Ayman Moussa, Paris 6) 10-31 January
- 4 Approximation of PDE2 (Brigitte Lucquin, Paris 6) 1-26 February
- 5 Applied Probability and Statistics (Naoyuki Ishimura, Tokyo) 29 February & 18 March
- 6 Probability II (Pierre Arnoux, Marseille) 21 March-8 April
- 7 Financial Mathematics II (Thomas Lim, Evry) 18 April-6 May
- 8 Number Theory (Michel Waldschmidt, Paris 6) 9-27 May
- 9 Optimization (Mark Gockenbach, Houghton,US) 30 May-24 June
- 10 Discrete Mathematics (Sok Lin and Hun Kanal, RUPP)
- 11 Numerical Analysis II (Seam Ngonn, RUPP)

Master of Mathematics

Partners

Partners

This project is international. Total budget: \sim \$130 000 per year.

- 2005-06: AUF (*Agence Universitaire de la Francophonie*)
CIMPA & IMU-CDC.
- 2007 Visit of Prof. Herb Clemens (IMU) (creation of Volunteer Lecturer Program).

► <http://www.mathunion.org/cdc/volunteer-lecturer-program/country-reports/vlp-cambodia/cambodia-2015/>

- 2007-15:
 - Strong support from IMU-CDC & US National Committee for Mathematicians
 - UNESCO (PISF: 1 year)
 - Toyota Foundation (2 years)
 - ISP
 - French Embassy (≤ 2012)
 - AUF (scholarships)
 - Universities (Japan, France, Spain, Philippines, Australia, USA, Sweden)
 - CIMPA

Master of Mathematics

Documents & Materials

Documents & Materials

- Almost all lecturers have their own lecture notes.
- Donations of books from CIMPA.
- ISP offered free access to many e-books.

- Need more documents.
- Students must have a free access to the books in the department of maths.

- IMU-CDC provided \$10 000 to buy 25 laptops.
- South Korea provided 10 laptops and 2 printers.

Master of Mathematics

- **The crucial point:** the Master has not the standard international level.
 - Very low level of the students after 4 years of Bachelor.
 - The best students have to complete a Master abroad, before starting a PhD.
 - So, after the Bachelor, they need at least
2 years (RUPP Master)+ 2 years (Master abroad)+ 3 or 4 years (PhD),
i.e. a total of 7 or 8 years.
-
- Master should be the continuation of the Bachelor.
 - Only weak interactions with the department of Mathematics.
 - The master received support from neither RUPP nor MEOYS.
 - **Partnerships** should be important for the sponsors.
 - First step of collaboration of the young PhD's holders with the foreign lecturers.
 - In a few years, Master courses will be done by PhD's holders.

Master of Mathematics

Scholarships

Scholarships

Great difficulties to find funds for mobility programs for the best students who are selected to continue their studies till the PhD.

Main sponsors:

AUF

French Embassy

IMU-CDC

EMS-CDC

CIMPA

Scholarship programs (France, Mexico, South Korea, India, Malaysia.)

Master of Mathematics

Graduate students

Graduate students

- 8 PhD's holders back in Cambodia since 2011:

France, 5. China, 1. Thailand, 1. Russia, 1.

- Positions:

RUPP 4, ITC 1, NIE 1, Ministry of Finance 1,
and 1 has no position.

- 5 PhD students:

France 2, South Korea 2, Malaysia 1.

- 20 Master abroad (since 2007):

France 5, South Korea 1, Mexico 4, India 1, Malaysia 1,
Japan 2, Tunisia 1, Thailand 3, Philippines 2.

4 students stayed 2 years (2012-2014) in Philippines.

- Postdoc 1 (6 months, University of Nice Sophia Antipolis)

PhD is the first step of the life of a mathematician. PhD's holders must do postdoc.

New

- Recruitment of the new generation done by locals.
- Orientation: more applied.
- New courses on Financial Mathematics.
- Practical training in “Pasteur Institut”.
- Tutoring with new PhD’s teachers.

Master of Mathematics

Future

Prospective

- **Excellence Program:** The goal is to raise the level of the students before starting the Master in order to have a Master with normal level. So, the best students will be able to start a PhD without having to complete another Master.

It is also the first step towards the succession by the young PhD's holders. From 2015, special trainings by PhD's holders for some selected students after Bachelor 2, **to raise their level and to go towards a master at the international level.**

It will be the first step of a collaboration with the department of Mathematics. Hope that the department of Mathematics agrees with this project.

Needs for financial support for these training sessions (\sim \$ 4 000 per year).

Master of Mathematics

Future

Prospective

- **SEAMaN:** 11 Master students for this generation and not more than 5 or 6 will be selected for Master 2.

From September 2015, some students from NUOL and Mandalay could attend the RUPP Master II.

- **SEAMaN:** From 2016, relationship RUPP-Master and network to be defined.

- **SEAMaN:** from 2016, Organization every year of at least one CIMPA-SEAMS-ISP school either in Phnom Penh or Vientiane or Mandalay.

- **SEAMaN:** 2018 or 19, Organization of a CIMPA-ISP school at Phnom Penh.