

# CIMPA – UNESCO – NEPAL RESEARCH SCHOOL

**JULY 19 - 31, 2010** (Shrawan 4- 16, 2067)

**Kathmandu University, Dhulikhel, Kavre**

**Background:** Kathmandu University (KU) was established by an act of parliament in November 1991, as an autonomous, not for profit, non-government public institution. It is an institution of higher learning dedicated to maintain high standards of world-class university devoted to bringing knowledge and technology to the service of Nepal. The university has the mission “*To provide quality education for leadership*”. The university offers long and short-term academic courses and programs through its **six** schools, which are School of Science (SOSC), School of Engineering (SOE), School of Management (SOM), School of Education (SOED), School of Medical Science (SOMS) and School of Arts (SOA).

**Mathematics Group at KU:** The School of Science was established in July 1992. The mathematics group in the Department of Natural Sciences (DONS), earlier known as Department of Mathematical Sciences, has been the leader in offering M. Phil. Programs in Mathematics/ Statistics, the first postgraduate programs in Nepal since 1997. The mathematics group in KU is involved in teaching a wide range of mathematics courses in **nine** programs of School of Science, **eight** programs of School of Engineering, one program of SOA and in the graduate program of School of Education. Besides teaching, this group is also dedicated to develop research activities and service to the community.

The mathematics groups in DONS has twelve faculties, three from statistics, two professors, three associate professors, five assistant professors and two lecturers. The group always envisages contributing teaching and research through a healthy and fruitful interaction with students and teachers via its programs. KU organized first National Conference on Mathematical Sciences and Its Applications (NCMSA) in 2006 and first ever International Conference on the Teaching of Mathematical Modelling and Applications (ICTMA 13) in 2007. Recently, KU successfully organized National School on Number Theory and Cryptography (NSNTC 2009) from December 25, 2009 – January 5, 2010. This group also regularly conducts short term programs like workshops/ schools on several topics.

Mathematics always plays a fundamental role in society and it has been considered to be a language for modern technology. Mathematics provides a practical framework for solving problems and making decisions. It also helps in building important skills such as the ability to think logically, analyze complex situations and to carry research. The study of mathematics therefore is a sound preparation for an academic career in various fields. Mathematics is among the most fascinating of all intellectual disciplines, the purest of all art forms, and the most challenging of games. Being an exact science, it seems to be abstract in nature; however it penetrates all fields of human endeavor. The theory of numbers has always occupied a unique position in the world of mathematics. Number theory is one of the most important branches and a very fertile research field of mathematics. One area that is particularly ‘hot’ these days is Cryptography and this is the art of making and breaking secret codes. Due to recent computer applications and advanced technological developments, these courses cover a wide range of research activities worldwide. But these subjects are still not taught as core subject in any level at the universities of Nepal. So, our students are not aware of these courses and their applications in real world.

## SCOPE

The objective of the school is to provide introductory training in Number Theory and Cryptography to graduate students and young research scholars, faculties from Nepal and other countries in the same area. The participants will get an opportunity to be familiar with basic concepts and developments of Number Theory and Cryptography and also their applications to computer science (computer security). They can get a platform to interact with each other, share knowledge, exchange views and discuss the topics of these thrust areas of mathematics. This international school has been recognized as a “*Satellite School*” for the International Congress of Mathematicians (ICM) that is going to be held at Hyderabad, India from **August 19 – 27, 2010**.

## Scientific Program with list of speakers:

The school will consist of two parts. The first part of 5 days is based on introductory elementary courses which are meant to prepare the attendants to the second part. The second part of 5 days is devoted to an introduction to some special topic in Number Theory and Cryptography. In total the school will consists in 8 – 10 courses of variable length with an average of 14 hours /hours. *The working language of the school is English*. The part wise brief outline of course is as follows:

**Part I:** Algorithmic introduction to Number Theory, Numerical methods, Introduction to probability theory, introduction to basic cryptography, finite fields, Wolfram Mathematica Laboratory.

**Part II:** Smooth numbers and their applications, Random sequences in Cryptography, elliptic curves in Cryptography, Riemann Zeta function, smooth numbers in Cryptography, Fixed points in Number Theory.

The school has been divided into three sessions:

Session I (9.00 a.m. – 11.30 a.m.) includes the theoretical classes and

Session II (1.00 p.m. – 4.00 p.m.) includes computer lab/ problem solving and applications.

Session III (4.00 p.m. – 6.00 p.m.) includes interaction and tutorials.

### Tentative List of Speakers:

01. Sukumar Das Adhikari, Harish Chandra Research Institute, India
02. Kalyan Chakroborty, Harish Chandra Institute, India
03. Corrado Falcolini, University of Roma Tre, Italy
04. Roberto Ferretti, University of Roma Tre, Italy
05. Elisabetta Scoppola, University of Roma Tre, Italy
06. Michel Waldschmidt, Institut de Mathematiques de Jussieu, France
07. Pierre Arnoux, Universite de la Mediterranee, Luminy
08. Shigeru Kanemitsu, Fukuoka, Japan
09. Florian Luca, UNAM Morelia
10. Christian Mauduit, Universite de la Mediterranee, Luminy
11. Francesco Pappalardi, University of Roma Tre, Italy
12. Igor Shparlinski, Maquarie University, Australia.
13. R.P. Pant, Kumaon University, India
14. K. Jha, Kathmandu University, Nepal.

### ELIGIBILITY

KU M. Phil. students, faculties, research scholars, IT professionals from academic institutes, Computer Engineers from industries, Government/semi-government organizations with specializations in mathematics/computer science/applications. The number of participants is limited to **15** for Nepalese participants and to **20** for foreign participants. However, academically sound and relatively young candidates will be encouraged and will be given higher priority for the selection.

### VENUE

The school will be in-house, intensive and full time by experts from India and abroad. The venue of the school is in the premises of KU, which is located in a scenario's tourist town Dhulikhel. Accommodation for registered outstation participants can be arranged on a sharing basis with prior request for the same, in nominal additional charges.

### REGISTRATION FEES

The registration fee for each Nepalese participant is **NRS 5,000.00 (Institutional)**.

The registration fee includes school kits with reading materials, breakfast/ lunch/ dinner, local transportation and other training expenses. The registered participants will be granted for full board and lodging (double room with sharing basis) only for the duration of the school and the extra days and extra activities will be on their own cost.

### MODE OF PAYMENT

The payment must be made either by money order or by demand draft or via bank transfer to KU through Nepal Investment Bank Ltd, KU Branch Code 005, Dhulikhel, **A/C No NPR 813 2630**.

### IMPORTANT DATES

Last date to receive applications for Nepalese participants: **MAY 31, 2010**

Selection and registration confirmation (through e-mail): **June 15, 2010**

### LOCAL SPONSORSHIPS

Sponsorship is solicited from University Grants Commission (UGC), Nepal Academy of Science and Technology (NAST), Nepal Mathematical Society (NMS), UNESCO Office, Nepal and other academic institutes.

## ORGANIZING COMMITTEE

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Kanhaiya Jha, Kathmandu University, Dhulikhel, NEPAL.

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Prof. Dr. B. M. Tuladhar, President, Nepal Mathematical Society, Nepal.

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Prof. Dr. P. R. Adhikary, Examination Controller, Kathmandu University (**KU**), Nepal.

Dr. Colin Kaiser, Director, UNESCO Office, Kathmandu, Nepal.

## NATIONAL ORGANIZING COMMITTEE (**NOC**), NEPAL

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Vice-president: Dr. Deepak Subedi, Head, Department of Natural Science, SOSc, KU, Dhulikhel.

Coordinator: **Dr. Kanhaiya Jha**, Department of Natural Science (*Mathematics*),  
School of Science, Kathmandu University, Dhulikhel, Kavre.

Members: Dr. Chet Raj Bhatta, , **Secretary**, Nepal Mathematical Society

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Mr. Pradeep Bahadur Thapa, CITE, **Purbanchal University**, Kathmandu

Dr. Ajay Singh, CDM, **Tribhuvan University**, Kathmandu

## IMPORTANT INFORMATIONS:

Applicants from outside Nepal may register online at:

<http://www.cimpa-icpam.org/anglais/Registration/applicationformcimpa.php>

Applicants from Nepal should send their applications to the coordinator, NOC:

**Dr. Kanhaiya Jha**, Coordinator of CIMPA School, School of Science,  
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