The Abdus Salam
International Centre for Theoretical Physics

UNESCO
United Nations
Educational, Scientific and
Cultural Organization

IAEA
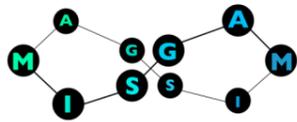International Atomic Energy Agency

CO-SPONSORED SCHOOL AND WORKSHOP ON INTEGRABLE SYSTEMS AND SCIENTIFIC COMPUTING

15 - 20 June 2009

ICTP, Miramare - Trieste, Italy

The Abdus Salam International Centre for Theoretical Physics (ICTP) is organizing a **Co-sponsored School and Workshop on Integrable Systems and Scientific Computing**, to be held from 15 to 20 June 2009, in Trieste, Italy. The activity will be directed by B. Dubrovin (SISSA/ISAS, Trieste, Italy), T. Grava (SISSA/ISAS, Trieste, Italy), C. Klein (Department of Mathematics, Dijon, France) and A. Kuijlaars (Katholieke Universiteit Leuven, Belgium). The activity is co-sponsored by the European Science Foundation (ESF) grant MISGAM (Method of Integrable Systems, Geometry and Applied Mathematics) and by SISSA.

The aim of this School/Workshop is to bring together mathematicians working in the community of integrable systems and numerical analysts. The School will cover different aspects of applications of integrable systems: theory of nonlinear waves, random matrices and discrete integrable surfaces. The analytical and numerical treatment of highly oscillatory solutions of nonlinear evolution partial differential equations arising in different fields of mathematical physics will be considered. This problem is very closely related to large N limits in random matrix theory and asymptotics for orthogonal polynomials.

Discrete differential geometry is an active mathematical terrain where differential geometry and discrete geometry meet and interact. It provides discrete equivalents of the geometric notions and methods of differential geometry, such as notions of curvature and integrability for polyhedral surfaces. Current progress in this field is to a large extent stimulated by its relevance for computer graphics and mathematical physics.

Main Topics

The activity will take place from Monday 15 June to Saturday 20 June.

There will be **6 courses**

• *Discrete differential forms in numerical Mathematical Physics* (J. Frauendiener, Center of Mathematics for Applications, Oslo)
• *Exponential integrators for stiff systems* (P. Matthews, School of Mathematics, Nottingham)
• *Numerical Method of PDEs with highly oscillatory solutions* (C.Klein, Department of Mathematics, Dijon)
• *Polyhedral surfaces and industrial applications* (A. Bobenko, TU Berlin)
• *Hamiltonian perturbation of hyperbolic PDEs and applications* (B. Dubrovin, SISSA, Trieste)
• *Riemann-Hilbert problems and random matrices* (A.Kuijlaars, Katholieke Universiteit Leuven)

and **10 seminars.**

Participation
Mathematicians from all countries that are members of the UN, UNESCO or IAEA may attend the School. Although the main purpose of ICTP is to help researchers from developing nations through a program of training activities within the framework of international cooperation, students and scientists from developed countries are also welcome to attend. As the activity will be conducted in English, participants must have an adequate working knowledge of that language.
Limited funds are available for some participants from, and working in, developing countries, not more than 45 years of age, to be selected by the Organizers. **Such financial support is available only for those who attend the entire activity.** The **ESF MISGAM grant** will support mostly participants from European countries.
Every effort should be made by candidates to secure support for their fare (or at least half-fare) from their home country. **There is no registration fee to attend the school.**

For participants from developing countries and those requiring VISA the closing date for receipt of requests for participation is 31 January 2009.

For those NOT requiring VISA the closing date for receipt of requests for participation is 15 March 2009.

HOW TO APPLY FOR PARTICIPATION
The application form can be accessed at the activity website: http://agenda.ictp.it/smr.php?2042
Once in the website, comprehensive instructions will guide you step-by-step, on how to fill out and submit the application form.

Activity Secretariat:
Telephone: +39-040-2240201
Telefax: +39-040-2240490
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Activity web page: http://agenda.ictp.it/smr.php?2042
ICTP Home Page: http://www.ictp.it

Directors

B. Dubrovin (Italy)
T. Grava (Italy)
C. Klein (France)
A. Kuijlaars (Belgium)

Local Organizer

C.E. Chidume
ICTP, Trieste, Italy

Lecturers

A. Bobenko (Germany)
B. Dubrovin (Italy)
J. Frauendiener (Norway)
C. Klein (France)
A. Kuijlaars (Belgium)
P. Matthews (UK)

Speakers

M. Bertola (Canada)
T. Claeys (UK)
T. Driscoll* (USA)
A. Fokas* (UK)
Shi Jin (USA)
D. Holm* (UK)
K. McLaughlin (USA)
P. Markowich (UK)
P. Miller (USA)
A. Ostermann (Austria)
* to be confirmed

DEADLINE

for receipt of applications

for those requiring VISA:

31 January 2009

for those NOT requiring VISA:

15 March 2009