# SUMMER SCHOOL AND CONFERENCE ON GEOMETRY AND TOPOLOGY OF 3-MANIFOLDS

#### 6 - 24 June 2005

ICTP, Miramare - Trieste, Italy

The Abdus Salam International Center for Theoretical Physics (ICTP) is organizing a **Summer School and Conference on Geometry and Topology of 3-manifolds** from 6 to 24 June 2005. The activity will be directed by M. Boileau (Université de Toulouse, France), C. Petronio (Università di Pisa, Italy), and B. Zimmermann (Università di Trieste, Italy).

The study and the classification of 3-dimensional manifolds is a major problem in geometry and topology. It has interactions with many other fields of mathematics (knot theory, geometric group theory, Riemann surfaces and Teichmüller theory, Kleinian groups, algebraic topology, differential and algebraic geometry), and many applications to physics and cosmology (conformal field theory, quantum field theory, relativity, astrophysics), and also to molecular biochemistry and biology. Central in the modern field of low-dimensional topology is the work of W. Thurston, and in particular his Geometrization Conjecture, which states that every compact 3-manifold can be canonically decomposed into geometric 3-manifolds (i.e., manifolds admitting one of the eight 3-dimensional geometries, among which the spherical, the Euclidean, and the hyperbolic ones). Recently G. Perelman made a breakthrough in R. Hamilton's program for proving the Geometrization Conjecture using the so-called Ricci flow equation. Other long-standing conjectures were also attacked with success in the last few years, and the whole subject of 3-dimensional geometry and topology appears to be enjoying a time of remarkable liveliness.

The aim of the School and the Conference is to introduce young mathematicians from developing countries to some fundamental techniques and recent developments in the field. The **main topics** will include:

Topology and Geometry of 3-manifolds - Hyperbolic geometry and Kleinian groups - Differential geometry and Ricci flow - Large scale geometry and convergence groups - Orbifolds and cone manifolds - Foliations and geodesic laminations - Varieties of group representations.

The following courses will be given during the **first week**, from 6 to 10 June 2005:

Introduction to 3-dimensional topology (C. Petronio, Pisa) Geometries of 3-manifolds (B. Zimmermann, Trieste) Kleinian groups (C. Series, Warwick) Introduction to Ricci flow (C. Sinestrari, Roma)

The following courses will be given during the second week, from 13 to 17 June 2005:

Hyperbolic and convergence groups (S. Maillot, Strasbourg) Cheeger-Gromov theory (M. Boileau, Toulouse) Tameness and Marden's conjecture (J. Souto, Bonn) Ricci flow with surgery (L. Bessiéres and G. Besson, Grenoble)

The list of speakers of the third week's conference, from 20 to 24 June 2005, includes:

I. Agol (Chicago), M. Baker (Rennes), S. Baseilhac (Grenoble), S. Boyer (Montreal), K. Bromberg (Salt Lake City), D. Calegari (Pasadena), O. Collin (Montreal), D. Cooper (Santa Barbara), N. Dunfield (Pasadena), R. Frigerio (Pisa), D. Gabai (Princeton), M. Heusener (Clermont-Ferrand), C. Hodgson (Melbourne), M. Kapovich (Davis), S. Kojima (Tokyo), M. Lackenby (Oxford), B. Martelli (Pisa), S. Matveev (Chelyabinsk), A. Mednykh (Novosibirsk), J. Morgan (New York), L. Paoluzzi (Dijon), R. Piergallini (Camerino), J. Porti (Barcelona), M. Sakuma (Osaka), A. Vesnin (Novosibirsk), S. Wang (Beijing), H. Weiss (Munich).

Mathematicians from all countries that are members of the UN, UNESCO or IAEA can attend the activity. The main purpose of the Centre is to help researchers from developing countries within the framework of international cooperation. However, scientists from developed countries are most welcome to attend. As the activity will be conducted in English, participants must have an adequate working knowledge of that language.

As a rule, travel and subsistence expenses of the participants are borne by their home institutions. However, limited funds are available for some applicants who are nationals of, and working in, developing countries, and who are not more than 45 years of age, to be selected by the Organizers. Such financial support is available only to those attending the entire activity. As scarcity of funds allows travel to be granted only in a few exceptional cases, 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.

### ORGANIZERS

**M. Boileau** *Toulouse, France* 

> C. Petronio Pisa, Italy

**B. Zimmermann** *Trieste, Italy* 

#### Local Organizer

L. Göttsche ICTP, Trieste, Italy

#### The closing date for the receipt of requests for participation is 20 January 2005

Candidates should complete, sign and return the **Application Form** obtainable through the ICTP WWW Server from the activity's WEB Page, which will be constantly updated:

http://agenda.ictp.trieste.it/agenda/current/fullAgenda.php?ida=a04195 The Application form should be sent to:

the Abdus Salam International Centre for Theoretical Physics Summer School and Conference on Geometry and Topology of 3-manifolds (smr1662)

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ICTP Home Page: http://www.ictp.it/

Trieste, October 2004

## DEADLINE

for receipt of applications:

20 January 2005