Intensive Research Period
May – July 2011

KNOTS & APPLICATIONS

Workshop
DNA Knots

15-16 June, 2011

Mathematical Research Centre (CRM) "Ennio De Giorgi"
Scuola Normale Superiore – Pisa, Italy

URL: http://www.crm.sns.it/hpp/events/event.html?id=146

Cellular DNA is a long, thread-like molecule with remarkably complex topology. Enzymes that control and manipulate the geometry and topology of cellular DNA perform many important cellular processes (including segregation of daughter chromosomes, gene regulation, DNA repair, and generation of antibody diversity). Some enzymes pass DNA through itself via enzyme-bridged transient breaks in the DNA; other enzymes break the DNA apart and reconnect it to different ends. DNA knots can encode important information about molecular biology in various ways.

In the topological approach to enzymology, circular DNA is incubated with an enzyme, producing an enzyme signature in the form of DNA knots and links. By observing the changes in DNA geometry (supercoiling) and topology (knotting and linking) due to enzyme action, the enzyme binding and mechanism can often be characterized.   Viruses pack DNA very tightly in capsids; upon release and circularization in the globular phase, the DNA knots produced can inform about the packing geometry. DNA is also packed very tightly in eukaryotic chromosomes, and some DNA knotting and linking may be present in the chromosome organization. This workshop will have talks discussing various aspects of DNA knotting and the relationship of knotting to biological understanding.

Plenary Speakers
Javier Arsuaga, SFSU, San Francisco, USA
Dorothy Buck, Imperial College London, UK
Isabel Darcy, U. Iowa, USA
Cristian Micheletti, SISSA, Trieste, IT
Andrzej Stasiak, U. Lausanne, CH
De Witt Sumners, Florida State U., USA
Mariel Vazquez*, SFSU, San Francisco, USA

* To be confirmed

Short Talks
Marco Baiesi*, U. Padova, IT
Mauro Mauricio, Imperial College London, UK
Angelo Rosa*, IIT, Genova, IT
Luca Tubiana, SISSA, Trieste, IT
Karin Valencia, Imperial College London, UK

Thematic Workshop Conveners
Dorothy Buck
Cristian Micheletti
De Witt Sumners

Program: Plenary lectures, short talks, thematic discussion, poster session.
Registration: Required via the website above.
Financial support: Prospective participants should seek grant/university support towards travel expenses. Limited funding towards participant local expenses may be provided by CRM and INdAM upon application. Participants seeking support should send their CV and list of publications to sumners@math.fsu.edu, before **13 March, 2011**.

Centro
di Ricerca
Matematica
Ennio De Giorgi

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Istituto Nazionale di Alta Matematica

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