



## Conference: From DNA-Inspired Physics to Physics-Inspired Biology

1 - 5 June 2009  
(Miramare - Trieste, Italy)

The Abdus Salam International Centre for Theoretical Physics (ICTP, Trieste, Italy) is organizing a **Conference: From DNA-Inspired Physics to Physics-Inspired Biology**, to be held at the ICTP, Trieste, Italy from **1 - 5 June 2009**. The Conference is being co-sponsored by The Wellcome Trust, London, U.K.

### TOPICS:

- DNA structure and function: 50 years after
- DNA mechanics - activating torsional, bending and translational degrees of freedom
- Intermolecular interactions (dispersion forces, electrostatic forces, Hydrophobic interactions, hydration forces, hydrogen bonding, Steric interactions) in the context of interactions between DNA interactions and DNA-lipid interaction
- Statistical physics of polyelectrolytes and polyampholytes (fluctuations and collapse, counterion condensation and adsorption, correlation effects, DNA condensation)
- DNA supercoiling and plectonomes, cyclization and looping propensities
- Assembly of nucleic acids, structure and physical properties (liquid crystalline phases of DNA, DNA packing in cells and in viral capsids: chromatin and packing on histones)
- Physical aspects of molecular genetics (homologous recombination of genes structure of protein-nucleic acid complexes, physics of transcription, statistical mechanics of DNA recognition by proteins, dynamics of search, physics of reverse transcription and retroviral diseases)
- Molecular motility on DNA (helicase)
- Motility of DNA (passage through narrow channels)
- Lipid-DNA complexes and gene therapy: delivery vs. release
- DNA and molecular electronics
- DNA-inspired supramolecular architectures, smart materials and chips

Modern theoretical physics methods have already penetrated into many of these topics. Our main goal will be not only to expose these results to biophysics colleagues, but also inform a group of influential, open-minded biologists about the findings obtained by physicists. We want to obtain an update from these biologists about the most challenging issues in their research disciplines.

The Conference programme will also include a Poster Session. For those interested in presenting a poster contribution, kindly submit a one-page abstract (size A4) and attach it to the online application form. File attachments should be in PDF format. The Organizers will evaluate which abstracts are to be presented and applicants will be informed accordingly.

**PARTICIPATION:** Scientists and students from all countries that are members of the United Nations, UNESCO or IAEA may attend. As the Conference will be conducted in English, participants should have an adequate working knowledge of this language. Although, the main purpose of the Centre is to help research workers from developing countries, through a programme of training activities within a framework of international cooperation, a limited number of students and post-doctoral scientists from developed countries are also welcome to attend.

As a rule, travel and subsistence expenses of the participants should be borne by their home institution. Every effort should be made by candidates to secure support for their fare (or at least half-fare). However, limited funds are available for some participants who are nationals of, and working in, a developing country, and who are not more than 45 years old. Such support is available only for those who attend the entire activity. There is no registration fee for attending this Conference.

### HOW TO APPLY FOR PARTICIPATION

The Application Form can be accessed at the activity website <http://agenda.ictp.it/smr.php?2038>

Once in the website, comprehensive instructions will guide you step-by-step, on how to fill out and submit the Application Form.

**Deadline for Requesting participation:**  
**1 MARCH 2009**

### ACTIVITY SECRETARIAT:

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### CONFERENCE DIRECTORS:

**A.A. Kornyshev**  
(Imperial College, London, UK)  
**W.K. Olson**  
(Rutgers University, NJ, USA)  
**V.A. Parsegian**  
(NIH, Bethesda, USA)

### LOCAL ORGANIZER:

**R. Gebauer**  
(ICTP, Trieste, Italy)

### Tentative List of Speakers:

(as of February 2009)

**G. Baldwin** (Imperial College, London, UK)  
**D. Bensimon** (ENS, Paris, France)  
**A. Cohen** (Harvard Univ., Cambridge, USA)  
**A. Crut** (LASIM, Villeurbanne, France)  
**R. Dame** (Leiden University, Netherlands)  
**G. Dietler** (EPFL, Lausanne, Switzerland)  
**A. Falaschi** (SNS, Pisa & ICGE, Trieste, Italy)  
**L. Finzi** (Emory Univ., Atlanta, USA)  
**W.M. Gelbart** (Univ. of California, LA, USA)  
**S.A. Harris** (Univ. of Leeds, UK)  
**J. Kadonaga** (Univ. of California, SD, USA)  
**M. Khan** (Uppsala Univ., Sweden)  
**C.-H. Kiang** (Rice Univ., Houston, USA)  
**A. Kolomeisky** (Rice Univ., Houston, USA)  
**M. Kupiec** (Tel Aviv Univ., Israel)  
**J. Langowski** (GCRC, Heidelberg, Germany)  
**R. Lavery** (IBCP, Lyon, France)  
**S. Leikin** (NICHD/NIH, Bethesda, USA)  
**S. Lemay** (Delft Univ., Netherlands)  
**Y. Levin** (IF-UFRGS, Porto Alegre, Brazil)  
**F. Livolant** (CNRS, Orsay, France)  
**J. Maddocks** (EPFL, Lausanne, Switzerland)  
**L.J. Maher** (Mayo Clinic Coll., Roch., USA)  
**P. Marszalek** (Duke Univ., Durham, USA)  
**A. Meller** (Boston Univ., USA)  
**A.M. Mount** (Univ. Edinburgh, Scotland)  
**M. Muthukumar** (Univ. Mass., USA)  
**T. Odijk** (Delft Univ., Netherlands)  
**M. Osipov** (Univ. Strathclyde, Scotland)  
**M. Peyrard** (ENS, Lyon, France)  
**R. Podgornik** (Univ. Ljubljana, Slovenia)  
**M. Prentiss** (Harvard Univ., Cambridge USA)  
**E. Raphael** (CNRS-ESPCI, Paris, France)  
**R. Roemer** (Univ. Warwick, Coventry, UK)  
**H. Schiessel** (Institut. Lorentz, Netherlands)  
**M. Schurr** (Univ. Washington, Seattle, USA)  
**G. Stanley** (Univ. Boston, USA)  
**E. Starostin** (Univ. College London, UK)  
**M. Stojanovich** (Columbia Univ., NY, USA)  
**B. Todd** (Purdue Univ., West Lafayette, USA)  
**A. Travers** (MRC-LMB, Cambridge, UK)  
**L. Williams** (Georgia Tech., Atlanta, USA)  
**G. Wuite** (VU Univ., Amsterdam, Netherlands)  
**L. Yakushevich** (Inst. Cell Biophysics, RAS, Pushchino, Russia)  
**L. Zechiedrich** (BCM, Houston, U.S.A.)