



BULLETIN

INTERNATIONAL CENTER FOR MATHEMATICS

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11

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COMING EVENTS

THEMATIC TERM ON MATHEMATICS AND BIOLOGY

ORGANIZERS

João A. C. Martins (IST, Lisbon, Portugal), Fernando Nogueira (University of Coimbra, Portu-

gal), Carlota Rebelo (University of Lisbon, Portugal) and Helder C. Rodrigues (IST, Lisbon, Portugal).

DATES

June - July, 2002.

The **Thematic Term** for 2002 will be dedicated to Mathematics and Biology. The application of mathematics to biology has had considerable effect on the development of new research areas at the interface of both sciences. The development of Mathematical Biology research requires interdisciplinary teams with great expertise on several scientific areas.

This Thematic Term has the objective of acting as a seed for the development and enlargement of mathematical research applied to biological systems centered on some expertise and areas that exist already within the teams working in Portugal.

The areas covered range from Ordinary Differential Equations; Dynamical Systems, Partial Differential Equations; Optimization; Numerical Analysis; Homogenization; Calculus of Variations; Nonlinear Continuum Mechanics; to Epidemiology; Population Dynamics; Molecular Geometry; Material Science; Bone Remodeling; Numerical Analysis and Design of Bone Prosthesis and Implants; Computer Simulation of the Mechanics of Soft Tissues and Muscles and Computer Simulation of the Heart and Circulatory System.

It is expected that a large number of graduate students and researchers not only from mathematics and biology, but also from engineering, physics and chemistry, may have the opportunity of exchanging their views and knowledge in order to establish a solid and fruitful collaboration in the near future.

The programme of events is the following:

17-21 June: School and Workshop on Mathematical and Computational Modeling of Biological Systems

ORGANIZERS: João A. C. Martins and E. B. Pires (IST, Lisbon, Portugal).

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The proposed activities have the following objectives:

- to provide an updated overview of some typical models and tools used in mathematical and computational studies of biological tissues, organs and systems;
- to attract new graduate students for this area, and/or to provide them with an incentive and a learning opportunity;
- to provide an opportunity for the development of interdisciplinary collaborations between mathematicians, biologists, physicists, medical doctors and engineers that are essential for the advancement of the sciences of life and that provide important challenges and progresses in the other sciences;
- to provide an opportunity for exhibition, presentation and discussion of the work of Portuguese researchers in this area;
- to contribute for the development of strong roots of the sciences of life in a school of engineering (the I.S.T.) where a B.Sc. degree on Biomedical Engineering is expected to start in the academic year of 2001-2002.

These events will be held at IST, Lisbon.

INVITED SPEAKERS:

- Prof. Gerhard A. Holzapfel, Graz University of Technology, Institute for Structural Analysis - Computational Biomechanics, Austria (Soft tissues, atherosclerotic arteries and balloon angioplasty, Finite Element Method).

- Prof. Peter J. Hunter, Engineering Science Department, University of Auckland, New Zealand (Electro-mechanics of the Heart, Finite Element Models).
- Prof. Jacques Huyghe, Department of Biomedical Engineering, Technical University of Eindhoven, The Netherlands (Thermo-chemo-electro-mechanics of saturated porous media).
- Prof. J. L. van Leeuwen, Wageningen University, Experimental Zoology Group, Department of Animal Sciences & Wageningen Institute of Animal Sciences, The Netherlands (Dynamics of skeletal muscles, neuromuscular control).
- Prof. Clyde F. Martin, Department of Mathematics and Statistics, Texas Technical University, Lubbock, Texas, U. S. A. (Control and mechanics of human movement systems).
- Prof. Oliver E. Jensen, Division of Theoretical Mechanics, School of Mathematical Sciences, University of Nottingham, United Kingdom (Physiological Fluid Mechanics)



24-28 June: Advanced School and Workshop on Bone Mechanics - Mathematical and Mechanical Models for Analysis and Synthesis

ORGANIZERS: Helder C. Rodrigues and José M. Guedes (IST, Lisbon, Portugal).

AIMS

This event will bring together researchers from applied mathematics, mechanics, biomechanics and medicine in a course/workshop in Bone Mechanics. This event has the following objectives:

- To introduce young researchers, in applied mathematics and mechanics, into the area

of bone mechanics and to its newest research developments.

- To stimulate the cooperation of the different research groups from mathematics, mechanics and medicine, focusing on the comparison of results of models and experiments and identifying areas of collaboration.
- To advance the area of biomechanics within the Portuguese research communities of applied mathematics and mechanics.
- To inspire mechanics and mathematics researchers to look at biological problems.

These events will be held at IST, Lisbon.

INVITED SPEAKERS:

- Prof. Martin P. Bendsoe, Technical University of Denmark- Mathematical Institute, Lyngby, Denmark.
- Prof. Andrej Cherkaev, Department of Mathematics, University of Utah, Salt Lake City, USA.
- Prof. Stephen C. Cowin, Department of Mechanical Engineering at City College, City University of New York, New York, USA.
- Prof. Manuel Doblaré, University of Zaragoza, Centro Politecnico Superior, Zaragoza, Spain.
- Prof. Harrie Weinans, Erasmus University Rotterdam, Erasmus Orthopaedic Research Lab, Rotterdam, The Netherlands.



27-29 June: Workshop on Molecular Geometry Optimization

ORGANIZER: Fernando Nogueira (Univ. Coimbra, Portugal).

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The workshop is intended to bring together mathematicians, chemists and physicists who work in molecular geometry optimization. Its main goal is, therefore, to allow the interchange of ideas between scientists with very different backgrounds and to provide a basepoint for the development of joint research projects. The use of high-performance computing software and hardware for performing realistic calculations of molecular structure will also be highlighted.

This event will be held at CIM, Coimbra.

INVITED SPEAKERS:

- Robert B. Schnabel, Department of Computer Science, University of Colorado at Boulder, USA.
- William E. Hart, Applied and Numerical Mathematics Department, Sandia National Laboratories, USA.
- Christodoulos A. Floudas, Department of Chemical Engineering Princeton University, USA.
- Tamar Schlick, Department of Chemistry and Mathematics, New York University, USA.
- Ron Wehrens, Laboratory of Analytical Chemistry, Catholic University of Nijmegen, The Netherlands.
- Peter Pulay, Department of Chemistry and Biochemistry, University of Arkansas, USA.

- Andrew Tuson, Department of Computing, School of Informatics, City University, London, UK.

15-19 July: Summer School on Mathematical Biology

ORGANIZERS: Alessandro Margheri (Univ. Lisbon, Portugal), Carlota Rebelo (Univ. Lisbon, Portugal) and Fabio Zanolin (Univ. Udine, Italy).

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The aim of this school is to present instances of interaction between two major disciplines, biology and mathematics, featuring recent issues from epidemiology and dynamics of populations. In this way, we expect to motivate the participants, biologists and mathematicians, to develop some future collaborations.

This event will be held at the Complexo Interdisciplinar (Univ. Lisbon).

INVITED SPEAKERS:

- Prof. Shair Ahmad, Division of Mathematics and Statistics, University of Texas at San Antonio, Texas, USA.
- Prof. Carlos Castillo-Chavez, Biometrics Unit, Cornell University, USA.
- Prof. Odo Diekmann, University of Utrecht, The Netherlands.
- Prof. M.Gabriela M. Gomes, Ecology and Epidemiology Group, Department of Biological Sciences, University of Warwick, England.

INTERNATIONAL CONFERENCE ON BOUNDED SYSTEMS AND COMPLEXITY CLASSES

ORGANIZER

Fernando Ferreira (Univ. Lisbon, Portugal).

DATE

28-29 June.

AIMS

To draw together people interested in bounded formal systems related to computational complexity classes in order to discuss current work and assess directions of research. If sufficient interest arises, international proceedings may be published.

This event will be held at the Complexo Interdisciplinar (Univ. Lisbon).

INVITED SPEAKERS

- Jeremy Avigad - Department of Philosophy, Carnegie-Mellon University, USA.
- Martin Hofmann - Department of Computer Science, The University of Edinburgh, United Kingdom.
- Ulrich Kohlenbach - Department of Computer Science, University of Aarhus, Denmark.
- Jan Krajíček - Mathematical Institute of the Academy of Sciences of the Czech Republic in Prague, Czech Republic.
- Thomas Strahm - Forschungsgruppe für theoretische Informatik und Logik, Institute für Informatik und angewandte Mathematik, Universität Bern, Switzerland.

For updated information on the CIM 2002 events, please visit the site

<http://www.cs.math.ist.utl.pt/cim.www/cimE/eventos02.html>

CIM ON THE WWW

Complete information about CIM and its activities can be found at the site

<http://www.cim.pt>

This is mirrored at

<http://at.yorku.ca/cim.www/>