

Editorial

Dear Colleagues,
CIM is already actively engaged in developing important and exciting activities for mathematicians with the support of the associated members.

To start, we are pleased to announce *The Summer School on Algebraic and Enumerative Combinatorics* that will be held in July, 2–13, 2012. The school will consist of four courses lead by mathematicians Francesco Brenti, Christian Krattenthaler, Marc Noy and Vic Reiner. While targeted to graduate students and post-doctorate researchers, the content will also prove beneficial to other level researchers, as well. In addition to the formal courses, there will also be short talks presented by summer school participants. The program will be hosted in the beautiful *Centro de Estudos Camilianos*, designed by the 1992 Laureate of the *Pritzker Architecture Prize* Álvaro Siza.

Another significant announcement is CIM's inaugural launch of the *Pedro Nunes Medal*. In 2011, the steering committees of CIM and SPM joined together to develop the proposal, which was enthusiastically supported. Later this year we will begin the process to convene an international panel to solicit and select the first recipients. Selection of medalists will be based on the meritorious research accomplishments with an emphasis on contributions to the development of mathematics in Portugal. Additional details will be provided in the near future.

The final activity I would like to bring to your attention is CIM's upcoming contribution to the international program *Mathematics of Planet Earth* (MPE 2013 — www.crm.umontreal.ca/Math2013/en/). To support this global effort,

CIM is organizing two international conferences and corresponding advanced schools: *Planet Earth, Mathematics of Energy and Climate Change*, 25–27 March 2013, with the *Advanced School Planet Earth, Mathematics of Energy and Climate Change*, 18–23 March and 27–28 March 2013; and *Planet Earth, Dynamics, Games and Science*, 2–4 September 2013, with the *Advanced School Planet Earth, Dynamics, Games and Science*, 26–31 August and 5–7 September 2013.

Each international conference will have around 15 keynote speakers and 30 thematic sessions for a total of approximately 100 speakers. The invited keynote speakers are top researchers in mathematics and science whose discoveries have had a great impact on the progress of science. The *Portuguese Society of Mathematics* (SPM), the *Portuguese Society of Statistics* (SPE) and the *Portuguese Society of Operational Research* (APDIO) enthusiastically support the conferences and advanced schools we are organizing for MPE-2013. The *Advanced School Planet Earth, Mathematics of Energy and Climate Change* will be hosted at Faculdade de Ciências, Universidade Lisboa (FCUL). The *Advanced School Planet Earth, Dynamics, Games and Science* will be hosted at Escola Superior de Economia e Gestão, Universidade Técnica de Lisboa (ISEG-UTL). The two international conferences will be hosted in Calouste Gulbenkian Foundation.

In closing, on behalf of the CIM Board, I would like to thank you for your continued support and interest.

Alberto Adrego Pinto

President of CIM

Contents

- 01 Editorial
- 02 Coming Events
- 04 Summer School “Dynamic Models in Life Sciences”
- 05 An Interview with Carla Gomes
by João Gama and Márcia Oliveira
- 09 Symplectic surface group representations and Higgs bundles
by Peter Gothen
- 15 An Interview with Robert MacKay
by João Lopes Dias
- 19 Detailed mathematical models in neurobiology—
Strong information in membrane conductances dynamics
by Eduardo Conde-Sousa and Paulo Aguiar
- 27 Modeling and simulation of the human cardiovascular system
by Alexandra Bugalho de Moura and Adélia Sequeira
- 35 An Interview with David Dingli
by Francisco Santos and Fábio Chalib