

Editorial

DEAR CIM COLLEAGUES,

On behalf of CIM, I would like to invite you to participate in the forthcoming CIM-MPE events being organized as part of the year-long, global celebration — Mathematics of Planet Earth 2013 (MPE-2013). These events are enthusiastically supported by many Portuguese institutions, including: SPM; SPE; APDIO; CEMAPRE; CEaul; CMA-UNL; CMAF-UL; CMUP; INESC-TEC; ISR; IT; UECE; Fernando Santos Sucessores Lda; FCUL; ISEG; Calouste Gulbenkian Foundation and Ciência Viva.

One CIM-MPE event is the international conference, Planet Earth, Dynamics, Games and Science, which will be held September 2–4, 2013 at the Calouste Gulbenkian Foundation. In addition to the conference an advanced school will be held August 26–31 and September 5–7 at the Instituto Superior de Economia e Gestão ISEG in Lisbon, Portugal.

Distinguished Keynote speakers and lecturers will include: ERIC MASKIN, CIM-SPM Pedro Nunes Lecture, Institute for Advanced Studies, USA (scheduled); MICHEL BENAÏM, Université de Neuchâtel, Switzerland; JIM CUSHING, University of Arizona, USA; JOÃO LOPES DIAS, Universidade Técnica de Lisboa, Portugal; PEDRO DUARTE, Universidade de Lisboa, Portugal; DIOGO GOMES, Universidade Técnica de Lisboa, Portugal; YUNPING JIANG, City University of New York, USA; JORGE PACHECO, Universidade do Minho, Portugal; DA-

VID RAND, University of Warwick, UK; MARTIN SHUBIK, Yale University, USA (by video); SATORU TAKAHASHI, Princeton University, USA; MARCELO VIANA, Instituto de Matemática Pura e Aplicada IMPA, Brazil

If you are interested in being involved in this conference, CIM is accepting proposals for thematic sessions. Proposals should include a session title and names and affiliations of 3–5 proposed speakers. If you are not interested in organizing a full session, but would like to give a presentation, send an email with your presentation title and abstract for consideration. Session proposals and presentation applications should be sent to aapinto@fc.up.pt and info.mpe2013@sqig.math.ist.utl.pt, by June 30.

Please remember to visit the event website to register: <http://mpe2013.org/workshop/dgs-2013-international-conference-and-advanced-school-planet-earth-dynamics-games-and-science-portugal-26-august-to-7-september-2013/>

The above conference and advanced schools are part of an ongoing series of events for MPE 2013, organized by CIM for Portugal. In March, CIM hosted the first CIM-MPE events — the international conference and advanced school, *Planet Earth, Mathematics of Energy and Climate Change*. Attendees at the opening ceremony were honored with the participation of the Honorable Mr. Secretary of State Professor João Queiró, FCT Board Member Professor Paulo Pereira, Portuguese Mathematical Society President Professor Miguel Abreu, Portuguese Statistical Society Board Member Professor Manuela Neves, MPT 2013 Executive Committee Mem-

Contents

01 Editorial

03 Coming Events

05 An interview with the Scientific Committee members of the Iberian Meeting on Numerical Semigroups — Vila Real 2012

by Manuel Delgado and Pedro García Sánchez

09 The multivariate extremal index and tail dependence
by Helena Ferreira

15 Numerical semigroups problem list
by M. Delgado, P. A. García-Sánchez and J. C. Rosales

27 Tracing orbits on conservative maps
by Mário Bessa

ber Professor Adérito Araújo, CMAF President Professor Luís Sanches, CMA Member Professor Fábio Chalub, Dom Luiz Institute Director Professor Pedro Miranda and the former CIM Presidents Professor José Perdigão Dias da Silva and Professor José Francisco Rodrigues.

During the Opening Ceremony, the President of CIM, together with Secretary Queiró, awarded the CIM Medals to the following distinguished recipients: JOSÉ PERDIGÃO DIAS DA SILVA, Universidade de Lisboa; L. TRABUCHO DE CAMPOS, Universidade Nova de Lisboa; JOAQUIM JOÃO JÚDICE, Universidade de Coimbra; JOSÉ FRANCISCO RODRIGUES, Universidade de Lisboa

The CIM Medals are awarded to mathematicians in recognition of meritorious contributions made during their scientific careers and to acknowledge their significant influence on the development of Mathematics in Portugal through affiliation with CIM.

In addition to those who participated in the opening ceremonies, CIM would like to thank the following keynote speakers and lecturers for their wonderful presentations: RICHARD JAMES, CIM-SPM Pedro Nunes Lecture University of Minnesota, USA; INÊS AZEVEDO, Carnegie Mellon University, USA; CHRISTOPHER K. R. T. JONES, University of North Carolina, USA; PEDRO MIRANDA, Universidade de Lisboa, Portugal; KEITH PROMISLOW, Michigan State University, USA; RICHARD L. SMITH, University of North Carolina, USA; JOSÉ XAVIER, Universidade de Coimbra, Portugal; DAVID ZILBERMAN, University of California, Berkeley, USA

CIM also appreciates the 60 invited speakers for their enlightening presentations and sincerely thanks the session organizers for their effort, commitment and dedication that was so vital for the success of the events: IVETTE GOMES, Universidade de Lisboa; STÉPHANE LOUIS CLAIN, Universidade do Minho; CARLOS RAMOS, Universidade de Évora; MIGUEL CENTENO BRITO, Universidade de Lisboa; RAQUEL MENEZES, Universidade do Minho; JOSÉ LUÍS DOS SANTOS CARDOSO, Universidade de Trás-os-Montes e Alto Douro; MÁRIO GONZALEZ PEREIRA, Universidade de Trás-os-Montes e Alto Douro; PATRÍCIA GONÇALVES, Universidade do Minho; JOÃO GAMA, Uni-

versidade do Porto; DELFIM F. M. TORRES, Universidade de Aveiro; PAULO A. V. BORGES, Universidade dos Açores; JOÃO PAULO ALMEIDA, Instituto Politécnico de Bragança; ALBERTO ADREGO PINTO, Universidade do Porto; NICO STOLLENWERK, Universidade de Lisboa; TÂNIA PINTO VARELA, Universidade Técnica de Lisboa; MARIA DA CONCEIÇÃO CARVALHO, Universidade de Lisboa; ANTÓNIO PACHECO PIRES, Universidade Técnica de Lisboa; MARGARIDA BRITO, Universidade do Porto; SÍLVIO M.A. GAMA, Universidade do Porto; JOÃO EMÍLIO ALMEIDA, Universidade do Porto.

In addition, CIM especially thanks IRENE FONSECA for her scientific guidance, ANTÓNIA TURKMAN for her assistance with the Calouste Gulbenkian Foundation, TELMO PARREIRA for organizing and compiling the proceedings, and PAULO MATEUS, PEDRO BALTAZAR and TELMO PARREIRA for developing and maintaining the conference website. CIM thanks the CGF staff and members of the local organizing committee (ALBERTO PINTO, FCUP; PAULO MATEUS, IST; PEDRO BALTAZAR, IST; TELMO PARREIRA, FCUP; ABDELRAHIM MOUSA, FCUP; JOÃO ALMEIDA, IPB; RENATO SOEIRO, FCUP; JOÃO COELHO, FCUP; BRUNO NETO, FCUP; FILIPE MARTINS, FCUP; JOANA BECKER, FCUP, RENATO FERNANDES, FCUP, RICARDO CRUZ FCUP), as well as the Calouste Gulbenkian Foundation, for incredible hospitality, throughout the event and for providing the speakers and participants with the opportunity to experience the friendly ambiance in the beautiful city of Lisbon.

Finally, CIM would like to remind you that review and research articles related to the two conferences will be published in the first two volumes of the *CIM Series in Mathematical Sciences*, which will be published by Springer-Verlag. The editors, Jean Pierre Bourguignon, Rolf Jeltsch, Alberto Pinto and Marcelo Viana, invite conference participants to submit review and research articles for consideration to aapinto@fc.up.pt and info.mpe2013@sqig.math.ist.utl.pt by December 31, 2013.

Alberto Adrego Pinto
President of CIM

Editors

Adérito Araújo (alma@mat.uc.pt)

António Fernandes (amfern@math.ist.utl.pt)

Sílvio Gama (smgama@fc.up.pt)

Address

IIIUL-Universidade de Lisboa

Av. Prof. Gama Pinto, 2

1649-003 Lisboa

The CIM Bulletin is published twice a year

Material intended for publication should be sent to one of the editors.

The Bulletin is available at www.cim.pt

The CIM acknowledges the financial support of FCT—Fundação para a Ciência e a Tecnologia



Coming Events



92nd European Study Group with Industry 2012 May, 6–10, 2013

ISEC—Institute of Engineering, Polytechnic of Coimbra,
Coimbra—Portugal

<http://dfm.isec.pt/esgi92/>

The 92nd European Study Group with Industry will be held from May 6 to May 10 2013 at ISEC (<http://www.isec.pt/>), the Coimbra Institute of Engineering, Polytechnic of Coimbra, Portugal, organized by the Department of Mathematics and Physics, ISEC-DMF (<http://www.dfm.isec.pt/>) and LCM – Laboratory for Computational Mathematics (<http://www.uc.pt/uid/lcm>) of Centre for Mathematics of the University of Coimbra (<https://cmuc.mat.uc.pt/rdonweb/>).

This meeting is part of the series of European Study Groups and will count with the participation of several European experts with a large experience in this type of events. The purpose of these meetings is to strengthen the links between Mathematics and Industry by using Mathematics to tackle industrial problems, which are proposed by industrial partners.

More information on Portuguese Study Groups is available at <http://www.ciul.ul.pt/~freitas/esgip.html>, while general information on study groups and related aspects is available at the International Study Groups website (<http://www.maths-in-industry.org>), the Smith Institute (<http://www.smith-inst.ac.uk>) and the European Consortium for Mathematics in Industry (<http://www.ecmi-indmath.org/info/events.php>).