6th Congress of Applied, Computational and Industrial Mathematics
VI MACI 2017

Comodoro Rivadavia (Argentina), May 2-5, 2017

Technical Report of the scientific meeting

The Sixth Argentinean Congress of Applied, Computational and Industrial Mathematics (VI MACI 2017) took place in the campus of the National University of Patagonia San Juan Bosco (UNPSJB), from May 2 through May 5, 2017. This congress was dedicated to the memory of Dr. Eduardo Serrano.

In order to successfully carry out the congress, grants were provided by the Argentine National Council of Scientific and Technological Research (CONICET), by the Argentine National Agency for Promotion of Science and Technology (ANPCyT), by the Society for Industrial and Applied Mathematics (SIAM), and by the International Council for Industrial and Applied Mathematics (ICIAM).

The VI MACI 2017 congress was organized by:

1) **ASAMACI – Argentine Association of Applied, Computational and Industrial Mathematics**, non-profit scientific institution created in Santa Fe City on October 31st, 2008, with juridical personality granted since 2009 (http://asamaci.org.ar).

2) **AR-SIAM, Argentine Section of SIAM**. AR-SIAM was approved by SIAM in July, 2006, and began its operations in January, 2007 (http://www.siam.org/sections/argentina/).

3) At a local level, this scientific meeting was organized by the **National University of the Patagonia San Juan Bosco (UNPSJB)**.

The Scientific Committee of the VI MACI 2017 Congress was comprised of:

- Pablo Jacovkis (UNTREF-UBA, Argentina)
- Pablo Lotito (PLADEMA-UNCPBA, Argentina)
- Cristina Maciel (UNS, Argentina)
- Pablo Rodriguez (ICMC-USP, Brazil)
- Horacio G. Rotstein (NJIT, USA)
- Diana Rubio (UNSAM, Argentina)
- Gabriel Soto (UNPSJB, Argentina)
- Rubén D. Spies (IMAL CONICET-UNL, Argentina)
- Domingo A. Tarzia (CONICET-UA, Argentina).

The local Organizing Committee of the VI MACI 2017 Congress was comprised of:

- Paola Bonfili (UNPSJB, Argentina)
- Nicolás Costa (UNPSJB, Argentina)
- Bernardo Marques (UNPSJB, Argentina)

- María de Gracia Mendonça (UNPSJB, Argentina)
- Hugo Montani (UNPA, Argentina)
- Cintia Negrette (UNPSJB, Argentina)
- Pablo Rodriguez (ICMC-USP, Brazil)
- Horacio G. Rotstein (NJIT, USA)
- Gabriel Soto (UNPSJB, Argentina), Coordinator
- Graciela Sottosanto (UNaCo, Argentina)
- Sebastian Vidal (UNPSJB, Argentina)
- Nelson Villagra (UNPSJB, Argentina).

The event was sponsored by: National University of Comahue, National University of Southern Patagonia, the Senate of the Argentine Republic, and the Argentine Association of Computational Mechanics (AMCA). Besides, the following companies supported it: YPF, Banco Patagonia, Banco Credicoop, Petrosar, ETAP, Club Neptuno, Anafer, Bivalvia, Austral Hotel, Hotel Comodoro, Geoambiente.

The main objectives of the congress were:

- To contribute to the development of original mathematical methods and techniques motivated by (among others) scientific, technological, industrial, engineering, economic and social problems.
- To promote researches leading to original methods and applications of mathematics.
- To provide a convenient environment for interchanging information and ideas among scientists, technologists, engineers and other professionals, involving the application and development of mathematical methods and techniques.
- To encourage the training of human resources, awakening and enhancing the interest of professionals, research fellows, Ph. D. students and young researchers in the techniques of applied mathematics, emphasizing their great importance through many practical applications.
- To disseminate all subjects related to applied mathematics and its relevance as a significant area of knowledge to advanced students of the different sciences, including mathematics, computer science, physics, economy, biology, chemistry and engineering, in order to contribute to the transfer of mathematical knowledge to other sectors, including industry and companies.

The congress was addressed to researchers, professionals, graduate students and undergraduate students of mathematics, physics, chemistry, biology and related sciences: economy, finances and engineering, who are interested in the development of mathematical methods motivated by other areas of knowledge and general mathematical applications.

The scientific congress VI MACI 2017 was organized as follows:

1) A total of 160 peer-reviewed scientific communications distributed in 22 scientific sessions were accepted.
2) The proceeding of the congress contains the publication of 148 contributed communications.
3) Delivering of three courses oriented to advanced undergraduate students and graduate students.
4) Offering of eight plenary talks.

The scientific sessions were:

1) Biomathematics, chaired by Mercedes Pérez Millán and Silvia Menchón
2) Mathematical Economy, chaired by Alejandro Neme

3) Differential Equations and Applications, chaired by Mariano de Leo and Juan Pablo Agnelli
4) Quantitative Finances, chaired by Manuel Maurette and Rodolfo Oviedo
5) Foundations of Numerical Methods and Applications, chaired by Ignacio Ojea and Adriana Pernich
6) Operations Research and Applications, chaired by Guillermo Durán and Javier Marenco
7) Industrial Mathematics and Applications, chaired by Adrián Will and Jorge Gotay
8) Computational Mechanics, chaired by Victorio Sonzogni and Martín Pucheta
9) Interdisciplinary Mathematical Models, chaired by Pablo Jacovkis and Rodrigo Castro
10) Optimization: Theory and Applications, chaired by Cristina Maciel and Laura Schuverdt
11) Probability, chaired by Beatriz Marron
12) Problems of Free Boundary and Applications, chaired by Claudia Lederman and Adriana Briozzo
13) Inverse Problems and Applications, chaired by Karina Temperini and María Inés Troparevsky
14) Mathematical Problems in Continuum Mechanics, chaired by Sergio Preidikman and Sergio Elaskar
15) Signal and Image Processing, chaired by Eduardo Serrano and Liliana Castro
16) Dynamic Systems, chaired by Guillermo La Mura and Ricardo Sánchez Peña
17) Theory of Optimal Control and Applications, chaired by Laura Aragone and Pablo Lotito
18) Heat and Mass Transfer, chaired by Eduardo Santillan Marcus and Graciela Morales
19) Computer Vision, chaired by Lucas Lo Vercio and Mariana del Fresno
20) High Performance Computing, chaired by Juan Pablo D'Amato and Pablo R. Rinaldi
21) Posters prepared by undergraduate students, chaired by Marcela Fabio and Marcela Morvidone
22) Posters prepared by graduate students, chaired by Marcela Fabio and Marcela Morvidone

Besides, a **Minisymposium** on "Mathematical modelling of random structures and complex systems" took place, coordinated by Pablo Rodriguez.

The judges of the Competition of Posters were Dr. Pablo Jacovkis, Dr. Alejandra Figliola and Dr. Pablo Rodriguez

Delivering of three four-hour courses, in charge of specialists in the respective subjects, namely:

- Horacio G. Rotstein (New Jersey Institute of Technology, USA), "Modelling and dynamics of neura systems".
- Pablo Rodriguez (Universidade de São Paulo, Brazil), "Discrete probabilistic models and applications".
- Graciela SottoSanto (Universidad Nacional del Comahue, Argentina), "An introduction to multi-objective optimization".

Offering of eight plenary talks, in charge of specialists in the respective subjects, namely:

- John A. Burns (Interdisciplinary Center for Applied Mathematics - Virginia Tech, USA), "Modeling and Approximation for Control and Optimization of Thermal Fluid Systems".
- Alicia Dickenstein (Universidad de Buenos Aires, Argentina), "Modern methods for the study of biochemical reaction networks".
- Avner Friedman (Ohio State University, USA), "Free boundary problems arising in biology".

- Lorenzo Fusi (Università degli Studi di Firenze, Italy), “Modelling the peristaltic flow of a Bingham fluid”.
- Rolf Jelstch (ICMC, San Carlos, Brazil and ETH Zürich, Switzerland), “Uncertainty quantification for two-phase flow in porous media”:
- Francisco Louzada (Universidade de São Paulo, Brazil), “Mathematical science innovation and transfer of technology in Brazil”.
- Hans Othmer (University of Minnesota, USA), “From crawlers to swimmers-Mathematical and computational problems in cell motility”
- Fabio Rosso (Università degli Studi di Firenze, Italy), “The mathematical paradoxes for the flow of a viscoplastic film in complex geometries”.

The communications received by the organizers were 183. After a peer-review process 160 were accepted, many of them in revised versions, to be presented and published in the proceedings. Four presentations corresponded to posters (three sent by graduate students, one sent by an undergraduate student).

The number of participants was 163 (144 from Argentina and 19 from abroad). The participants from abroad were 3 from Brazil, 4 from Chile, 2 from Colombia, 4 from USA, 3 from Spain, 2 from Italy and 1 from Switzerland. Besides, 57 participants were students (7 undergraduates, 47 graduates coming from Argentinean universities and 3 graduates coming from foreign universities).

The accepted communications accepted were published in the series MACI, Volume 6 (2017), ISSN 2314-3282, edited by Gabriel Soto and Nicolás Costa. The total number of pages is 588 corresponding to the 148 communications orally presented. See:

http://asamaci.org.ar/institucional/publicaciones-2

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