

Scientific Report

XXXIX Congresso Nacional de Matemática Aplicada e Computacional

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Site: <http://www.cnmac.org.br/novo/index.php/CNMAC/ano/2019/>

About

The Congresso Nacional de Matemática Aplicada e Computacional (CNMAC) is an annual meeting organized by the Brazilian Society of Computational and Applied Mathematics (SBMAC), being the largest meeting about Applied, Computational and Industrial Mathematics in Brazil, and Latin America. The congress aims to bring together professors, researchers, students, and other professionals from the most diverse areas of Applied and Computational Mathematics, to disseminate and discuss recent results of their research and work in progress. Thus, the event has become a meeting point for the main national and regional institutions. The CNMAC program includes short courses, mini-symposiums, conferences, technical oral communication sessions, and general poster sessions. In addition, other special sessions are devoted to Teaching and Scientific Divulcation, including activities for elementary school teachers. In 2019 it has been organized the 39th edition of the CNMAC.

The XXXIX CNMAC (2019) in numbers

In this new edition of the meeting, there were 10 plenary conferences, 6 short courses, 11 mini-symposiums and 1 round table (about scientific divulgation). In addition, the event's schedule had some satellite activities: Mathematics and Statistics Marathons, a Programming Marathon, a Teachers' Meeting, a Scientific Divulcation Show, and the CNMACquinho (a set of activities for children and adolescents). This year the meeting had around 780 participants. In this edition, the submitted works were presented in the categories of Oral Communication or Posters and were divided into 14 Technical Sessions. At all, we had 126 oral communications, 209 poster presentations by undergraduate students, and 123 poster presentations by graduate students and other researchers. These 458 accepted works (presented at the CNMAC) will be published in the Proceeding Series of the Brazilian Society of Computational and Applied Mathematics (ISSN 2359-0793). On the other hand, this year, the CNMAC was the meeting point of researchers from different countries from Latin America. This has been possible thanks the organization of the mini symposium intituled Applied Mathematics in Latin America, with the participation of speakers coming from Argentina, Brazil, Colombia, Ecuador, Paraguay and Perú.

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General Program CNMAC 2019

Below are the main activities of the meeting. The Book of Abstracts (in Portuguese) is included at the end of this report.

Conferences:

- Celina M. H. de Figueiredo (UFRJ) - O problema do milênio sobre intratabilidade computacional.
- Márcio Murad (LNCC) - Recent Advances in Multi-scale Modeling of Coupled Flow.
- George Corliss (Marquette University) - Math for Fighting Malaria.
- João F. C. A. Meyer (Unicamp) - Meio ambiente e Matemática: uma necessidade e um desafio urgentes!
- Cláudio T. Silva (New York University) - Urban Data Science.
- Cláudia Linhares Sales (UFC) - Some heuristics to color graphs and their worst performance
- Leo Dorst (University of Amsterdam) - Get Real: How Geometric Algebra Subsumes Linear Algebra.
- Daiana dos Santos Viana (IME-USP) - Condições de otimalidade para otimização cônica.
- Thomas Nogueira Vilches (UNESP) - Mathematical Epidemiology in Complex Networks.
- Lucas Wagner (UFF) - Um novo modelo matemático estocástico para a geração do jitter na produção da fala

Minicourses:

- Gabriel Haeser (USP) - Condições de Otimalidade e Algoritmos em Otimização não Linear.
- Paulo Mancera (UNESP, Botucatu) - Modelagem Matemática em Câncer e Quimioterapia: Uma introdução.
- Margarete Oliveira Domingues (INPE) - Introdução ao Mundo das Wavelets.
- Moiseis dos Santos Ceconello (UFMT) - Sistemas dinâmicos fuzzy: modelagens alternativas para sistemas biológicos.
- Leo Dorst (University of Amsterdam) - All Geometry in One Algebra?!
- Edmilson Rodrigues (UFU) e Leandro Alves Pereira (UFU) - Modelagem e otimização de experimentos com misturas.

Minisymposia:

- 1) Otimização Robusta Baseada em Confiabilidade: Conceitos e Aplicações.
- 2) Stochastic Modeling and Uncertainty Quantification.
- 3) Códigos e Reticulados Algébricos.
- 4) Mulheres nas ciências exatas?
- 5) Teoria e Prática em Álgebra Geométrica.
- 6) Percolação, Teoria da Informação e Sistemas de Partículas Interagentes.
- 7) Geometria de Distâncias e Aplicações.
- 8) Mathematics Against Crime.
- 9) Incerteza Generalizada, Teoria de Conjuntos Fuzzy em Análise Matemática.
- 10) Matemática Aplicada e Formação de Professores para a Educação Profissional e Tecnológica.
- 11) Matemática Aplicada na América Latina.

Speakers supported by CDC-IMU:

- 1) Álvaro Riascos (Universidad de los Andes, **Colombia**). He presented the talk *Regression by clustering using Metropolis-Hastings in the Minisymposium Applied Mathematics in Latin America*, and the talk *Addressing feedback loop from crime prediction models in Bogota in the Minisymposium Mathematics Against Crime*.
- 2) Catalina Rua (Universidad de Nariño, **Colombia**). She presented the work *Resolução Numérica para Sistemas de Equações Diferenciais Ordinarias Não-lineares Rígidos (together with an undergraduate student)* in a Technical Session of Numerical Methods.
- 3) Christian Shaerer (Universidad Nacional de Asunción, **Paraguay**). He presented the talk *On using control theory for improving some iterative Krylov subspace methods for solving $Ax=b$ in the Minisymposium Applied Mathematics in Latin America*.
- 4) Obidio Rubio (Universidad Nacional de Trujillo, **Perú**). He presented the talk *A posterior Error Estimates for the Finite Element Solution of a Transport Equation of CO₂ in a Pulmonary Alveolus in the Minisymposium Applied Mathematics in Latin America*.
- 5) Pedro Merino (Escuela Politécnica Nacional, **Ecuador**). He presented the talk *A full Second-order methods for sparse optimization problem Alveolus in the Minisymposium Applied Mathematics in Latin America*.

Acknowledgements

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Prof. Dr. Pablo M. Rodriguez

Coordinator CNMAC 2019