REPORT

CIMPA RESEARCH SCHOOL;
ALGEBRAIC METHODS IN CODING THEORY

Ubatuba, SP, 02 a 15 de julho de 2017

The ***CIMPA RESEARCH SCHOOL: Algebraic Methods in Coding Theory*** was held at the Hotel Wembley Inn, in Ubatuba, SP, from July 2nd to July 15th, 2017 and had 60 participants, being 34 of them Brazilian and 26 visitors from forteen countries distributed as follows:

Argentina	5
Colombia	3
Denmark	1
Egypt	1
Spain	2
United States	1
Finland	1
France	2
Irland	3
Mauritius	1
Mexico	3
Portugal	1
Senegal	1
Turkey	1

All of these came to Brazil just to participate in this meeting.

Eleven Brazilian institutions of higher education were represented in the event: Faculdade de Engenharia Industrial, Universidade Federal do ABC, Universidade Federal DE Juiz de Fora, Universidade Feder de Minas Gerais, Universidade Federal de Uberlândia, Universidade Federal de Viçosa, Universidade Federal de São Paulo, Universidade Federal de São José dos Campos, Universidade de Campinas, Universidade de São Paulo and Universidade de São Paulo-São Carlos.

The Scientific Committee was composed by:

Maria Bras-Amorós (Spain)
Marinês Guerreiro (Brazil)
André Leroy (France
César Polcino Milies (Brazil)
Juan Jacobo Simón Pinero (Spain)

The local organizing committee waas composed by:

Cícero Carvalho (Universidade Federal de Uberlândia)
Gladys Chalom (Universidade de São Paulo)
Raul Ferraz (Universidade de São Paulo)
Luciane Quoos (Universidade Federal do Rio de Janeiro)
César Polcino Milies (Universidade de São Paulo e Universidade Federal do ABC)

The meeting was organized by the *Instituto de Matemática e Estatística da Universidade de São Paulo* (IME-USP), the *Instituto Nacional de Ciência e Tecnologia de Matemática* (INCT-MAT) and the *Centre International de Mathématiques Pures et Appliquées* (CIMPA).

The event was also sponsored by the *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior* (CAPES), the *Fundação de Amparo à Pesquisa de São Paulo* (FAPESP) and the *International Mathematical Union* (IMU).

During the meeting, siw minicourses were offered, orgabized promerily for PhD students but which were of interest also for researchers participating, since all of them included recente research. They were the following:

- Group Algebras in Coding Theory (C. Polcino Milies and Marinês Guerreiro).
- Character Theoretic Tools for Studying Linear Codes over Rings and Modules (Jay Wood).
- Numerical Semigroups in Coding Theory (Maria Bras-Amorós).

- Application of Results from Commutative Algebra to the Study of certain Evaluation Codes (Cícero Carvalho).

- Convolutional Codes (Diego Napp).

- Some Algorithms from Defining Sets in Abelian Codes (Juan Jacobo Simon Pinero).

During the second week the following plenary talks were offered:

- André Leroy.- *Decomposition of singular nonnegative matrices into product of nonnegativeidempotents.*

- Fernando Torres.- *On the genus of a maximal curve.*

- Herivelto Borges.- *(N,d)-arcs arising from plane maximal curves.*

- Marcelo Firer.- *Metrics in Coding Theory.*

- Ricardo Podestá.- *Block-transitive AG-codes attaining the Tfasman-Vladut-Zink bound.*

- Suely Costa.- *Lattices Applied to Coding for Reliable and Secure Communication.*

Also the following short talks were given:

- Alonso Castellanos. -*Weierstrass Semigroup over Kummer Extensions.*

- Beatriz Motta.- *P-Chain Codes.*

- Cintya Winnk.- *Construction of lattices via quaternion algebras.*

- Elif Saçikara.- *Concatenated Structure and a Minimum Distance Bound for Generalized Quasi-Cyclic Codes.*

- Fabio Brochero Martinez.- *Factoring polynomials of the form f(x^n) in Fq[x].*

- Fergal Gallagher.- *Linear Codes using Cyclic and Dihedral Group Algebras (part 2).*

- Grasielle Jorge.- *Rotated unimodular lattices via number fields*

- Guilherme Tizzotti,- *On Gröbner basis for certain one-point AG codes.*

- Gustavo Terra Bastos.- *Geometrically uniform subspace codes.*
- John Hermes Castillo.- *Coding theory and SAGE.*
- Leo Creedon.- *Construction of Linear Codes using Cyclic and Dihedral Group Algebras*
- Marinês Guerreiro.- *Ds-bounds for cyclic codes: new bounds for abelian codes.*
- Raul Antonio Ferraz.-*Essential idempotents in Group Algebras.*
- Samir Assuena.- *Left metacyclic codes.*
- Victor G. Lopez Neumann.- *Minimal weight codewords of affine cartesian codes.*

Besides these activities, on the evening of Thursday, 13.07.2017, aposter session was held, where PhD students and researchers could presente and explain their on-going.