

First Joint Meeting Brazil–France in Mathematics
Special Session: Graph Theory

organized by

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Theoretical Computer Science forms the foundations of computing. One of its primary aims is to provide a mathematically grounded theory for developing sophisticated algorithms for real-world problems. This includes mathematical modelling of algorithmic approaches, estimation of the complexity of computational problems, and understanding the limits of efficient computation through computational complexity. The P versus NP problem is a major unsolved problem in Theoretical Computer Science, one of the seven Millennium Prize Problems selected by the Clay Mathematics Institute. It asks whether every problem whose solution can be quickly verified (in polynomial time) can also be solved quickly (again, in polynomial time). In presenting NP-hardness results, a problem is introduced and then various restrictions on its instances are considered and the effect on its complexity. A full complexity dichotomy of a graph class with respect to a problem is a partition into graph subclasses such that the problem is classified as polynomial or NP-complete when restricted to each subclass. The dual concepts of separating problem and separating class investigate why a certain problem is NP-complete in a graph class. The long and fruitful Brazil–France partnership in the area of Graph Theory has strongly contributed to the development of the area, and the session reflects the collaboration in the past thirty years. Special attention is given to new areas developed by young researchers such as chi-bounded functions and graph classes, and the parameterized multivariate perspective on algorithms and complexity. We thank the financial support given by FAPERJ, L’Oreal, the Brazilian-French Network in Mathematics, and the French Consulate in Rio de Janeiro.

CONFIRMED SPEAKERS

Ana Shirley Silva (Universidade Federal do Ceará)

Diana Sasaki Nobrega (Universidade do Estado do Rio de Janeiro)

Guilherme Dias da Fonseca (Université Clermont Auvergne)

Ignasi Sau (LIRMM, Montpellier)

Jayne L. Szwarcfiter (Universidade Federal do Rio de Janeiro)

Leo Liberti (École Polytechnique)

Mario Valencia-Pabon (Université Paris-Nord)

Nelson Maculan Filho (Universidade Federal do Rio de Janeiro)

Philippe Michelon (Université d’Avignon)

Raphael Carlos Santos Machado (INMETRO, Universidade Federal Fluminense)

Simone Dantas de Souza (Universidade Federal Fluminense)

Sulamita Klein (Universidade Federal do Rio de Janeiro)

Sylvain Gravier (Université Joseph Fourier)

Yoshiko Wakabayashi (Universidade de São Paulo)