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2023

09h00
-
18h00

2023-T3 RECENT TRENDS IN COMPUTER ALGEBRA

Computer Algebra for Functional Equations in Combinatorics and Physics

Institut Henri Poincaré
Amphithéâtre Hermite / Darboux
11 rue Pierre et Marie Curie
75005 Paris

INSCRIPTION

Workshop with special week and topical day

Detailed informations on the dedicated website: [Special week](#) , [Workshop](#) and [Topical day](#) .

Special week

URL de la page : https://www.ihp.fr/fr/agenda/computer-algebra-functional-equations-combinatoric-and-physics&is_pdf=true

November 27 to December 1, 2023

- Creative Telescoping (long course, Monday to Friday 9:30-12:00), [S. Chen](#), [M. Kauers](#), and [C. Koutschan](#)
- A generating function method for the determination of differentially algebraic integer sequences modulo prime powers (short course, Monday and Tuesday 15:00-17:00), [C. Krattenthaler](#)
- General audience presentation, Wednesday 15:00-16:00, [W. Zudilin](#)
- General audience presentation, Wednesday 16:00-17:00, [X. Caruso](#)
- Special session of the [Differential Seminar](#), Thursday and Friday 15:00-17:00. Speakers: [M. Mezzarobba](#), [M. Mishna](#), [T. Rivoal](#), and [B. Salvy](#).
- Rencontre à l'heure du thé "La suite logistique" by Xavier Caruso. Thursday November 30, 16:00-17:00, Maison Poincaré, Salon de thé

Workshop: Computer Algebra for Functional Equations in Combinatorics and Physics

December 4 to 8, 2023

Organisers: [A. Bostan](#), [J. Bouttier](#), [T. Cluzeau](#), [L. Di Vizio](#), [C. Krattenthaler](#), [P. Lairez](#), [J.-M. Maillard](#).

In many areas of pure and applied mathematics, as well as in computer science and in theoretical physics, functional equations form either the object of study or important tools for applications. We are currently experiencing increasingly strong interactions between theory and applications, many common actions having taken place over the past ten years. By functional equations, we mean mainly ordinary differential equations, with differences, with q -differences, Mahlerian, linear or algebraic, possibly multivariate. For instance, nonlinear algebraic differential equations emerge naturally in integrable models in physics (Painlevé equations, Schlesinger systems, KdV equations, etc., associated with Lax pairs, Yang-Baxter equations,...). All these types of functional equations have been and are still very actively studied from many points of view, using algebraic, arithmetic and geometric tools. A recent trend is that computer algebra algorithms are more and more used to solve functional equations arising in enumerative combinatorics and in statistical physics. Notable examples come from questions related to lattice walks. In combinatorics, basic objects like trees, maps, permutations, and Young tableaux can be represented by models of walks confined to cones. In physics, many objects, including polymers and queueing models, are accurately modeled by walks on lattices, particularly those evolving in cones with several boundaries. This workshop brings together representatives from the three different communities (computer algebra, combinatorics and theoretical physics) to discuss longstanding conjectures, to learn each other's techniques and to plan the directions for the future.

Invited speakers

- Arvind Ayyer , Bangalore, India
- Mireille Bousquet-Mélou Bordeaux, France
- Jehanne Dousse Geneva, Switzerland
- Tony Guttman , Melbourne, Australia,
- Charlotte Hardouin , Toulouse, France
- Mark van Hoeij , Tallahassee, Florida, USA
- Stephen Melczer , Waterloo, Canada
- Igor Pak , Los Angeles, USA
- Gleb Pogudin , Palaiseau, France
- Kilian Raschel , Angers, France
- Dan Romik , California, USA
- Carsten Schneider , Hagenberg, Austria
- Alan Sokal , London, UK
- Pierre Vanhove , Saclay, France
- Michael Wallner , Vienna, Austria
- Nicholas Witte , Wellington, New Zealand

Topical day

- **Elimination for Functional Equations.** *December 11, 2023*

Organizer: G. Pogudin

Speakers: Hadrien Notarantonio , André Platzter , Daniel Robertz , Sonia Rueda , Alexandros Singh , Nathalie Verdière



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HORAIRES

L'institut :

- lundi au vendredi de 8h30 à 18h,
- fermé les jours fériés.

Le musée - Maison Poincaré :

- lundi, mardi, jeudi et vendredi de 9h30 à 17h30,
- samedi de 10h à 18h,
- fermé le mercredi et le dimanche.