



From  
**18**  
SEP.  
2023  
to  
**29**  
SEP.  
2023

09h00  
-  
18h00

## **2023-T3 RECENT TRENDS IN COMPUTER ALGEBRA**

### **Fundamental algorithms and algorithmic complexity**

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

INSCRIPTION

**Workshop with special week**

### **Special week**

*September 18 to 22, 2023*

- Efficient Algorithms for Integer and Polynomial Matrices (long course, Monday to Friday), G. Labahn and A. Storjohann
- Euclidean Lattices (short course, Tuesday 19th and Wednesday 20th), D. Stehlé
- General audience presentation, Wednesday 20th, J. van der Hoeven

URL of the page: <https://www.ihp.fr/en/events/fundamental-algorithms-and-algorithmic-complexity>

September 25 to 29, 2023

**Organisers:** J. van der Hoeven, M. Giesbrecht, P. Koiran, G. Villard

The field of computational complexity aims at understanding the capabilities of computational devices and especially how fast various problems can be solved. A lot of research focuses on isolating and studying complexity classes of those problems that can be solved using a certain amount of resources. One of the most interesting and challenging problem in the area of computer algebra, is to develop tools and methods in complexity theory that also reflects running times that are observed in practice, for a wide selection of data types. The computer algebra research community indeed produces software that proceed on various mathematical objects and having high impact. This requires expertise from many areas of computer science and of mathematics.

This workshop aims at bringing together experts from both the theoretical and more practical sides, while covering a wide spectrum of problems from algebra, geometry, symbolic computation, arithmetic, and numerical computation. Specific challenges that the workshop will focus on include the following: polynomials in complexity, structured problems, tensors, complexity and specification, certificates and their links with delegated computation, efficiency in crypto-algebra algorithms, HPC implementation of core algorithms, complexity in numerical analysis.

## Invited speakers

- Frédéric Chyzak, Inria, Palaiseau, France.
- Annie Cuyt, University of Antwerp, Belgium.
- Pranjal Dutta, School of Computing, National University of Singapore.
- Joachim von zur Gathen, Professor emeritus, Universität Bonn, Germany.
- Laura Grigori, Inria, LJLL, Paris, France.
- David Harvey, University of New South Wales, Sydney, Australia.
- Nadia Heninger, University of California, San Diego, USA.
- Gábor Ivanyos, Research Institute for Computer Science and Control, Budapest, Hungary.
- Fredrik Johansson, Inria, IMB, Bordeaux, France.
- Grégoire Lecerf, CNRS, LIX, Palaiseau, France.
- Visu Makam, Radix Trading Europe B.V.
- Guillaume Moroz, Inria, LORIA, Nancy, France.
- Clément Pernet, Université Grenoble Alpes, LJK, France.
- Markus Püschel, ETH Zürich, Switzerland.
- Daniel Roche, United States Naval Academy, Annapolis, USA.
- Chris Umans, California Institute of Technology, USA.
- Nitin Saxena, Indian Institute of Technology, Kanpur, India.
- Éric Schost, University of Waterloo, Ontario, Canada.
- Sébastien Tavenas, CNRS, LAMA, Le Bourget-du-Lac, France.
- Benjamin Wesolowski, CNRS, UMPA, ENS de Lyon, France.
- Lihong Zhi, Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Beijing, China.



## **INSTITUT HENRI POINCARÉ**

Sorbonne Université / CNRS  
11 rue Pierre et Marie Curie  
75231 Paris Cedex 05

### **TIMETABLE**

The institute:

- Monday to Friday from 8:30am to 6pm,
- closed on public holidays.

The museum - Maison Poincaré :

- Monday, Tuesday, Thursday and Friday from 9:30am to 5:30pm,
- Saturday from 10am to 6pm,
- closed on Wednesday and Sunday.