



From  
**10**  
OCT.  
2022  
to  
**14**  
OCT.  
2022

09h00  
-  
18h00

## **2022-T3 GEOMETRY & STATISTICS IN DATA SCIENCES**

### **Geometry, Topology and Statistics in Data Sciences**

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

### **Geometry, Topology and Statistics in Data Sciences**

**10-14 October - IHP, Paris**

On one hand, modern data science makes use of Topological Data Analysis in a preliminary step to obtain structural information before processing supervised or unsupervised methods. On the other hand, when a priori knowledge of a Riemannian manifold containing the data is available, shape analysis proposes to adapt mathematical statistics tools to infer geometric and statistical properties.

#### **Invited Speakers**

URL of the page: <https://www.ihp.fr/en/events/geometry-topology-and-statistics-data-sciences>

- Dominique Attali (GIPSA-lab) - *Reconstructing manifolds by weighted  $\ell_1$ -norm minimization*
- Martin Bauer (Florida State University) - *Elastic shape analysis of surfaces*
- Omer Bobrowski (Technion Israel Institute of Technology) - *Universality in random persistence diagrams*
- Frédéric Barbaresco (Thales) - *Symplectic foliation model of information geometry for statistics and learning on Lie groups*
- Claire Brécheteau (University Rennes 2) - *Approximating data with a union of ellipsoids and clustering*
- Nicolas Charon (Johns Hopkins University) - *Registration of shape graphs with partial matching constraints*
- Herbert Edelsbrunner (Institute of Science and Technology Austria) - *Chromatic Delaunay mosaics for chromatic point data*
- Barbara Gris (Sorbonne University) - *Defining data-driven deformation models*
- Heather Harrington (Oxford University) - *TBA*
- Kathryn Hess (EPFL) - *Morse-theoretic signal compression and reconstruction*
- Irène Kaltenmark (Université de Paris) - *Curves and surfaces. Partial matching in the space of varifolds.*
- Eric Klassen (Florida State University) - *The square root normal field and unbalanced optimal transport*
- Johannes Krebs (KU Eichstaett) - *On the law of the iterated logarithm and Bahadur representation in stochastic geometry*
- Nina Miolane (UC Santa Barbara) - *Geomstats: a Python package for Geometric Machine Learning*
- Steve Oudot (Inria Paris Saclay) - *Optimization in topological data analysis*
- Victor Patrangenaru (Florida State University) - *Geometry, topology and statistics on object spaces*
- Stephen Preston (City University of New York) - *Isometric immersions and the waving of flags*
- Stefan Horst Sommer (University of Copenhagen) - *Diffusions means in geometric statistics*
- Katharine Turner (Australian National University) - *TBA*
- Yusu Wang (UC San Diego) - *Weisfeiler-Lehman meets Gromov-Wasserstein*
- Laurent Younes (Johns Hopkins University) - *Stochastic gradient descent for large-scale LDDMM*



## 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.