Antoine Commaret

Third year of PhD - 2023-2024

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Education

- 2025 **Post-doctorate**, *INRIA Sophia-Antipolis*, équipe ABS, Valbonne, France. Convergence of geometric Markov chains. Optimization of non-smooth functions.
- 2021 2024 **PhD Candidate**, *DataShape Team*, *INRIA Sophia-Antipolis & J. A. Dieudonné Lab*, France. "Persistent Geometry", under the supervision of David Cohen-Steiner & Indira Chatterji.
- 2019 2020 Master 2 "Mathématiques, Vision, Apprentissage" with highest honors, ENS Paris-Saclay. Courses over the mathematics of Vision and Learning.
- 2017 2019 Master 1 & Last Year of Bachelor, École Normale Supérieure de Paris, France. General advanced maths in the highly selective mathematics path of the ENS.
- 2015 2017 Classes préparatoires aux Grandes Ecoles, Lycée Hoche, Versailles, France. Admitted to both École Polytechnique and ENS Paris after 2 years of intense preparation.
- 2012 2015 Baccalauréat scientifique with highest honors, Lycée Jean-Pierre Vernant, Sèvres, France.

Research residency and internships

Juil 2025 Research guest.

Institute of Geometry, directed by Michael Kehrber. Graz, Austria;

Charles University. Visiting Jan Rataj. Prague, Czechia;

Algebraic Systems Biology team directed by Heather Harrington. Dresden, Germany.

Feb 2023 Startup Week 3IA, Sophia-Antipolis.

One week project on the segmentation femoral arteries on ultrasound scans for Caranx Medical.

June 2022 Summer School EUTOPIA, Paris.

Topology in the context of soft matter and proteins.

- 2020 2021 **Research Internship**, *INRIA Saclay*, under the supervision of Frédéric Chazal & Bertrand Michel. TDA and study of the dimension reduction algorithm UMAP.
 - 2019 **Research Internship**, Göttingen University, Germany, under the supervision of Harald Helfgott. Analytic Number Theory. Reviewing the proof of the weak Goldbach conjecture.

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Teaching

2021 – 2026 Lecturer, Université Côte d'Azur.

Introduction to Topological Data Analysis (M2), Graph Theory, Analysis I, Algebra II (Bachelor)

2017 – 2021 Colleur in Preparatory Classes, Lycée Hoche, Versailles.

Weekly oral exams.



Talks & Conferences

July 2025 Max-Planck Institute, Dresden, Germany.

Talk about links between topology and geometry and tools from persistent homology.

March 2025 **Jean Kutzmann lab seminar**, Grenoble, France.

Talk about PhD results.

Oct 2023 Young Researcher in Geometry Day, Paris, France.

Organization and talk about Geometric measure theory.

July 2023 Young Topologist Meeting, Lausanne, Switzerland.

 ${\it Talks for } \ {\it Generalized Morse theory for tubular neighborhoods}.$

Feb 2023 World AI Festival, Cannes, France.

Presenting the work done during the startup week 3IA.

June 2022 Math PhD Students' Colloquium, Nice, France.

& 2023 Talks about persistent homology & Organization.

Q Languages

Native French

Fluent English, German

Beginner Esperanto, Italian

── ⟨/> Programming

Advanced Python: Machine Learning with Numpy, Scipy, Pytorch and Topological data analysis with GUDHI.