

Joan Arenillas i Cases

Oxford, UK | [LinkedIn](#) | [GitHub](#)
Mail: joan.arenillasicases@maths.ox.ac.uk

EDUCATION

University of Oxford

DPhil in Mathematics

October 2026 – Present

Oxford, UK

- Research on Computational Fluid Dynamics with Machine Learning methods.

Imperial College London

MSc in Applied Mathematics

September 2025 – September 2026

London, UK

- Followed the Scientific Computing and Machine Learning (SCML) stream.
- Courses in (Computational) PDEs, Computational Linear Algebra, Mathematical Machine Learning and Statistical Learning, Optimisation, and Formalising Mathematics (Lean).

Autonomous University of Barcelona

BSc in Mathematics. Honours in 6 courses. Grade: 8.9/10.

September 2019 – June 2025

Barcelona, ES

- Top 3 of my graduating class.
- Courses in Differential Geometry, Galois Theory, Numerical Methods, Real, Complex, and Functional Analysis, Statistics, and Data and Image Processing.
- Semester Exchange at the University of British Columbia, Canada. Honours in all courses. Average grade: 98%

Autonomous University of Barcelona

BSc in Physics. Honours in 10 courses. Grade: 9.1/10.

September 2019 – June 2024

Barcelona, ES

- Top 3 of my graduating class.
- Courses in Statistical Mechanics, General Relativity, Astrophysics, Optics, Particle Physics, Modelisation, and Accelerator Physics.

RESEARCH & PROFESSIONAL EXPERIENCE

Quantitative Financial Risk Analyst

Deloitte

September 2024 – September 2025

Barcelona, ES

- Developed mathematical and statistical Credit Risk Models at Deloitte's Risk team.
- Optimized Loss Given Default estimations by refining data distribution models using SQL and SAS.
- Analysed key credit risk drivers and their impact on the Probability of Default.
- Delivered data-driven insights and communicated outcomes to teams across the organisation.

Undergraduate Research Intern

ALBA Synchrotron

December 2023 – June 2024

Barcelona, ES

- Collaborated with the Beam Dynamics Group to develop efficient numerical integrators for radiation-emitting elements (Insertion Devices) in the accelerator.
- Developed new estimation methods to calculate equilibrium parameters of the electron beam distribution.
- Contributed to and integrated our C and MATLAB code into a widely-used accelerator physics Github repository.
- Presented and defended the new methodology to an international, 20-person division panel, and integrated the findings into my Physics BSc Thesis.

PROJECTS

Neural Geodesic Flows and Eisenhart metric

December 2025 – September 2026

- Part of my Master's Thesis at Imperial College London.
- Advanced the field of dynamical systems discovery by bringing together the Eisenhart metric and neural geodesic flows.

Euclidean Proofs Generator

June 2024 – June 2025

- Independently developed Euclidean proofs of the infinitude of prime numbers in arithmetic progressions.
- Effectively implemented a Python algorithm capable of generating automatic Euclidean proofs of Dirichlet Theorem, using Algebraic Number Theory and Galois Theory.

- Designed and built a fully functional website to make the automated proofs available to the general public. Obtained an excellent grade of 9.7/10.

Numerical Integrator for Synchrotron Lattice

December 2023 – June 2024

- Developed new numerical integrators for particle accelerators using Ohmi's Envelope Formalism.
- Used Hamiltonian formalism to derive accurate measures of energy loss within the machine.
- Collaborated with the ALBA Synchrotron, and shaped the work into my Physics BSc Thesis, for which I obtained a grade of 9.4/10.

SCHOLARSHIPS AND AWARDS

Postgraduate Fellowships Abroad | *Fundació "la Caixa"*

May 2026

- Awarded annually to 100 selected students, this fellowship funds my DPhil studies at the University of Oxford.

Silver Medal at Imperial Learning Analytics Hackathon | *Imperial College London*

November 2025

- Developed an AI-powered assistant that automatically schedules module-specific study sessions based on students' performance, selected goals, and time availability. Presented the results at an NTU-Imperial joint conference.

CSIC JAE Intro Fellowship | *Government of Spain*

2024 and 2025 Editions

- The Spanish Government awards research fellowships to selected university students across Spain. Each fellowship consists of a 7-month research experience at a prestigious Spanish scientific institution.

Research Studentship | *ALBA Synchrotron*

June 2023

- Awarded a 7-month undergraduate research fellowship at the ALBA Synchrotron.

AGAUR Mobint Scholarship | *Government of Catalonia*

October 2022

- Grant for International Exchange at the University of British Columbia during the 2022-2023 academic year.

Extraordinary Baccalaureate Scholarship | *Government of Catalonia*

September 2019

- The Government of Catalonia awards a scholarship for the first year of university to students who achieve outstanding grades on an exam taken by top-performing undergraduates.

SIGNIFICANT EXTRACURRICULAR ACTIVITIES

Directed Reading Programme Group Leader | *Imperial College London*

October 2025 – January 2026

- Led a group of 6 mathematics undergraduates on their first steps in mathematical research.
- Explored Algebraic Number Theory topics through group discussions and dedicated exercises.
- Developed communicative abilities by teaching advanced topics to a diverse audience.

Teaching Assistant | *Autonomous University of Barcelona*

May 2023 – May 2024

- Served as teaching assistant during various mathematics and statistics workshops.
- Created original mathematical problems from scratch to engage with the public.

English Teaching Assistant | *Fundació Autònoma Solidària*

February 2023 – June 2023

- Volunteered as a high school English teaching assistant in under-resourced communities.
- Helped high school students develop their communicative abilities in English.

Student Mentor | *Autonomous University of Barcelona*

September 2020 – June 2021

- Provided guidance and support to first-year students, helping them navigate academic and social aspects of university life.

ONLINE TRAINING

Introduction to Artificial Intelligence | *IBM*

August 2025

- Explored the foundational principles of AI through a 4-week course.

Python Programming Fundamentals | *University of Toronto*

August 2023

- Strengthened my abilities in core concepts of Python programming by completing an intensive 3-week course.

TECHNICAL SKILLS

Programming Languages: Python, C, SQL, SAS, R, Java, MATLAB.

Libraries: PyTorch, JAX, TensorFlow, Seaborn, NumPy, SciPy, Pandas, Matplotlib.

Software & Developer Tools: HTML, Git, Visual Studio, Excel, L^AT_EX.

Languages: English C2 level (Grade: 220/230), Spanish (Native), Catalan (Native), and French (Basic proficiency).

THESES AUTHORED

MSc Thesis in Applied Mathematics (2026): Dynamical Systems Discovery with Neural Geodesic Flows and the Eisenhart metric. Available at:

https://github.com/joarca01/neural_geodesic_flows/blob/main/master_thesis/Neural_Geodesic_Flows_Report.pdf.

BSc Thesis in Mathematics (2025): Euclidean proofs of the infinitude of primes in arithmetic progressions.

Available at: <https://github.com/joarca01/final-math-bsc-thesis>.

BSc Thesis in Physics (2024): Development and Implementation of Ohmi's Envelope Formalism for Insertion Devices with Radiation. ALBA Synchrotron.