Marçal Herraiz Bayó

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Personal website ⍐

Barcelona, Spain

EDUCATION

Université Paris Sciences et Lettres — Paris, France
Present
Sept. 2025
Master of Science in Mathematics
- Joint master's between École Normale Supérieure and Université Paris Dauphine.
- All expenses covered by the FSMP Master Scholarship 2025.

University of Barcelona — Barcelona, Spain
June 2025
Sept. 2020
Bachelor of Science in Mathematics — GPA: 9.02/10
- Excellent with honors in 12 subjects.
- Thesis: "The Riemann–Hilbert Correspondence for Flat Connections on Principal Bundles." Grade: 10/10

University of Barcelona — Barcelona, Spain
June 2025
Sept. 2020
Bachelor of Science in Physics — GPA: 8.79/10
- Excellent with honors in 10 subjects.
- Thesis: "Improving Classical Shadows with Grouping Strategies." Grade: 9.7/10

Mireia Center of Studies — Barcelona, Spain
June 2020
Sept. 2018
Technological Baccalaureate — GPA: 10/10
- 1st-ranked student of the class.

WORK EXPERIENCE

Westinghouse Nuclear — Madrid, Spain
Present
July 2025
Simulation Modeling Engineer
- Developing software for advanced nuclear simulations.
- Enhancing thermal-hydraulics models for improved accuracy and performance.

RESEARCH EXPERIENCE

Barcelona Supercomputing Center – BSC — Barcelona, Spain
Visiting Student
June 2025
Nov. 2024
- Developed a unified strategy to improve quantum measurement efficiency.
- Demonstrated significant performance gains in many-body quantum systems.
- Achieved high precision with fewer measurements than standard methods.
- Supervisors: Dr. Bruno Julià, Berta Casas, Sergi Masot.

Institute for Research in Biomedicine – IRB — Barcelona, Spain
Research Intern
Feb. 2025
July 2024
- Modeled DNA flexibility using a coarse-grained approach.
- Optimized the model to account for DNA damage.
- Devised and implemented new methods to calculate DNA geometric properties.
- Supervisor: Prof. Dr. Modesto Orozco.

Center for Mathematical Research – CRM — Barcelona, Spain
Research Intern
Aug. 2023
June 2023
- Studied transcendental dynamics within the complex exponential family.
- Supervisors: Prof. Dr. Núria Fagella, Prof. Dr. Xavier Jarque.

Honors and Awards

March 2025	**FSMP Master Scholarship**	28,000 €
	• Awarded by the Fondation Sciences Mathématiques de Paris to fully fund my Master's studies at PSL.	
Nov. 2024	**Collaboration Scholarship**	2,000 €
	• Issued by the Spanish Ministry of Education, this scholarship is aimed at university students to conduct research in university departments.	
Oct. 2024	**CRM Internship Programme Award** (declined)	500 €
	• Awarded to bachelor students who want to do their Bachelor's thesis advised by a researcher affiliated with the CRM.	
July 2024	**Maths4Life Awardee**	1,200 €
	• Awarded one of the five grants from IRB Barcelona's Maths4Life Programme to conduct research at the intersection of mathematics and biomedicine.	
June 2025 Sept. 2021	**Excellent Performance**	1,900 €
	• Recipient of the University of Barcelona's honor for exceptional academic performance throughout my university studies.	
Sept. 2020	**Honors in Baccalaureate**	1,700 €
	• Awarded to students with an excellent academic record during their baccalaureate. Full coverage of tuition fees for the first year of university.	
Oct. 2019 Jan. 2019	**Mad for Science Programme**	
	• Catalunya La Pedrera Foundation developed the Mad for Science Programme to open the doors of the leading research institutes to exceptional High School students. I participated in the Physics course.	

Invited Talks

June 2025	**Research Seminar at BSC**
	• Presented the outcomes of my research stay at BSC.
Sept. 2024	**Extraordinary BioMed Seminar – Maths4Life 2024**
	• In this seminar organized by IRB, I presented my research work undertaken as a summer intern.
July 2023	**Barcelona Introduction to Mathematical Research – BIMR 2023**
	• Presented the results of my summer internship at CRM to an expert audience.

Languages

Spanish	Native Speaker
Catalan	Native Speaker
English	C1 Level
French	A2 Level

Coding Skills

Languages: Python, C, Fortran, R, Bash, Mathematica.
Libraries: Pandas, SciPy, NumPy, Scikit-learn, Seaborn.
Other: Experience with Unix/Linux, computational modeling, and version control.

Additional Courses

- **Python for Data Science and Machine Learning** – Udemy ⌇
- **Machine Learning with Python** – Coursera ⌇
- **100 Days of Code: The Complete Phyton Pro Bootcamp** – Udemy ⌇