# Marçal Herraiz Bayó

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*Personal website* ⬈

Barcelona, Spain

## EDUCATION

**Université Paris Sciences et Lettres**  Paris, France
Master of Science in Mathematics
*Present – Sept. 2025*
- All expenses covered by the PGSM Master Scholarship 2025.

**University of Barcelona**  Barcelona, Spain
Bachelor of Science in Mathematics  GPA: 9.02/10
*June 2025 – Sept. 2020*
- 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
Bachelor of Science in Physics  GPA: 8.79/10
*June 2025 – Sept. 2020*
- Excellent with honors in 10 subjects.
- Thesis: "Improving Classical Shadows with Grouping Strategies."  Grade: 9.7/10

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

## WORK EXPERIENCE

**Westinghouse Nuclear**  Madrid, Spain
*Simulation Modeling Engineer*
*Present – July 2025*
- 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

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|---|---|---|
| March 2025 | **PGSM 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

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|---|---|
| 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** Advanced C1 Level

## Coding Skills

**Languages**: Python, C, Mathematica, LaTeX, Bash, SageMath.
**Libraries**: Pandas, SciPy, NumPy, Scikit-learn, Seaborn.
**Other**: Experience with Unix/Linux and computational modeling.

## 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 ⌁