

Víctor Ballester Ribó



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I am a PhD student in the Department of Astronautics at Imperial College of London. I graduated in 2023 in Mathematics at Autonomous University of Barcelona and next year I moved to Paris to pursue a master degree at Dauphine-PSL University in Applied and Theoretical Mathematics. My main interests are in the field of Computational Mathematics and PDEs. Specifically, I am particularly interested in the application of Mathematics to Fluid Dynamics.



Education

PhD in Aeronautics

October 2024 - Present



Imperial
College
Logo
[Imperial College of London](https://www.imperial.ac.uk)



London, UK
United
Kingdom
Flag

- Working with Nektar++ software on compressible fluids.

M2 in Applied and Theoretical Mathematics

September 2023 - July 2024



Dauphine - PSL University
Logo



Paris, France



France
Flag

- GPA: 16.54 / 20.00
- Minor in Physics, specifically in Computational Fluid Dynamics.
- Final master's project (supervised by [Alexandros Alexakis](#) and [Emmanuel Dormy](#)): 2D turbulence spreading.

Bachelor's Degree in Mathematics

September 2019 - July 2023



UAB
Autonomous University of Barcelona
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Cerdanyola, Spain



Spain
Flag

- GPA: 9.42 / 10.00
- Ranked #1 in my graduating class.
- Honors: 186 / 240 ECTS
- Final bachelor's project (supervised by [J.M. Mondelo](#)): Numerical propagation of trajectories of Earth-orbiting spacecraft (grade: 10.00 / 10.00 with honors).

Baccalaureate

September 2017 - May 2019



La
Llauna
INS La Llauna
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Badalona, Spain



Spain
Flag

- GPA: 7.74 / 10.00
- Research project: Particle physics (grade: 10.00 / 10.00).
- Achieved a grade of 11.498 / 14.000 in the University entrance exams (PAU).



Experience

Imperial Formula Racing

October 2024 - Present



Imperial
College *by Imperial College of London*
Logo



London, UK
United Kingdom
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- Member of the Aerodynamics team for the Imperial Formula Racing team, competing in the Formula Student competition.

NMK Undergraduate and Graduate Summer Camp

July 14-28, 2024



Nesin
Mathematics Village
Nesin Mathematics Village
Logo



Selçuk, Turkey
Turkey
Flag

- Attendance to courses on Dynamical Systems, PDEs and Probability.

Barcelona Introduction to Mathematical Research 2023

July 03-28, 2023



BGSM Barcelona Graduate School of Mathematics
Logo



Barcelona, Spain
Spain
Flag

- Attendance to minicourses on Introduction to Research, from the fields of Algebraic Topology and Number Theory to Applied Mathematics and Discrete Mathematics.
- Worked on a research project (supervised by [Jezabel Curbelo](#) and [Álvaro Meseguer](#)): From chaotic dynamical systems to fluid turbulence.

HackUPC 2023

May 12-14, 2023



UPC by Polytechnic University of Catalonia
Logo



Barcelona, Spain Spain
Flag

- Gained knowledge on the applications of artificial intelligence in the optimization of resources.
- Worked on a project of predicting the values of the stock market and on a project of optimizing the demand of the company HP.

Datathon

June 11-12, 2022



Aily Labs by Aily Labs
Logo



Barcelona, Spain Spain
Flag

- Gained knowledge on the applications of artificial intelligence in the health sector.
- Worked on a project for the detection of glaucoma in retinal images, using computer vision techniques and CNNs.

Private Tutor

September 2018 - April 2023



Self-employed



Badalona, Spain Spain
Flag

- Taught Mathematics, Physics and Chemistry to teenage students.



Volunteering

Trail Maintainer

August 11-31 2024



Thórsmörk, Iceland



Iceland
Flag

- I volunteered together in a group of 12 people in Thórsmörk region in Iceland doing duties such as: changing timbers that serve as steps, redirecting parts of paths, eliminating small scree slopes, adding drains, widening paths or planting trees

Tourist Guide

July 31 - August 21 2023



Wadi Rum, Jordan



Jordan
Flag

- I worked alone helping a family with his business, which consisted in guiding in jeep tours in the Wadi Rum desert and cooking for the tourists.

Hotel General Maintainer

July 8 - August 19 2022



Belfast, UK



United
Kingdom
Flag

- I worked in a team of 4 people in the maintenance of the hotel, which consisted in cleaning the rooms, common areas and the kitchen.



Selected Projects and Reports

2D turbulence spreading

February 2024 - July 2024

Fluid dynamics, Turbulence, HPC, C, C++



Report



Code

- Simulation of 2D Navier-Stokes equations with a pseudo-spectral method in order to study the spreading of turbulence in a 2D fluid.
- Final Master thesis of the Applied Mathematics's degree at Paris-Dauphine University.
- Grade: 18.00 / 20.00
- Advised by [Alexandros Alexakis](#) and [Emmanuel Dormy](#).

2D Numerical simulation of Von Kármán vortex street

February 2024 - March 2024

C++, Finite difference, Navier-Stokes equations



Report



Code

- Study of the Von Kármán vortex street and the different types of solutions that can be obtained.
- Project conducted as part of the course Numerical methods at Université Paris-Dauphine.
- Co-authored with [Jona Nägerl](#).

Numerical study of the 2D Kuramoto-Sivashinsky equation

September 2023 - January 2024

Flame propagation, C++, Spectral methods, FFT



Report



Code

- Study of the different types of solutions of the 2D Kuramoto-Sivashinsky equation and the bifurcations that occur between them.
- Project conducted as part of the course Instabilities and nonlinear phenomena at École Normale Supérieure.
- Advised by [Laurette Tuckerman](#).

Numerical propagation of trajectories of Earth-orbiting spacecraft

January 2023 - July 2023

Astrophysics, C, C++, Academic Writing



Report



Code

- Reconstruction of orbits of satellites from real initial data when considering the Earth a non-uniform spherical distribution of mass and other minor perturbations.
- Final Bachelor thesis of the Mathematics's degree at Autonomous University of Barcelona.
- Grade: 10.00 / 10.00 with honors
- Advised by [Josep Maria Mondelo](#).

Notes in Mathematics

August 2020 - July 2024

Mathematics, Academic Writing



Website



Code

- Summaries of each subject of the Mathematics's degree at Autonomous University of Barcelona.

Numerical simulation of the n-Body Problem

August 2022

Physics, C, Python, Matplotlib



Code

- Integrated the n-Body Problem in 2 and 3 dimensions considering the bodies as point masses.
- Developed a program using C for the numerical computation and Python for plotting the results.

AI for Connect-4 game

September 2022 - November 2022

Connect 4, C, AI, Minimax

 Code

- Implemented artificial intelligence for the classical Connect-4 game using the Minimax algorithm.
- Project conducted as part of the course Advanced Mathematics at the Autonomous University of Barcelona.
- Advised by [Vicenç Soler](#).

Measuring musical dissonance

April 2021 - June 2021

Mathematical Modeling, C, Music, Academic Writing

 Report  Code

- Modeled the dissonance and consonance of musical tones from the point of view of simple tones.
- Developed a program using C to run the model.
- Wrote a report on the development and implementation of the model, and the results of the simulations.
- Project conducted as part of the course Workshop in Mathematical Modelling at the Autonomous University of Barcelona, co-authored with [Oriol Bosquet](#) and [Carlo Sala](#).
- Advised by [Xavier Mora](#).

Number of spanning trees in a graph and minimum spanning tree

January 2021

C, Graphs, Trees, Discrete Mathematics, Academic Writing

 Report

- Report on the number of spanning trees in a graph and algorithms for finding the minimum weight spanning tree.
- Project developed as part of the course Discrete Mathematics at the Autonomous University of Barcelona, co-authored with [Oriol Bosquet](#), Eric Recio and [Carlo Sala](#).

Classification of Convex Cones

May 2020

C, Linear Algebra

 Code

- Program that classifies the convex cone generated by input vectors in the 3-dimensional real vector space.
- Project developed as part of the course Computational Tools for Mathematics at the Autonomous University of Barcelona.
- Advised by [Joaquim Roé](#).



Skills

Industry knowledge

- Programming
- Mathematical Modeling
- Numerical Analysis
- Applied Mathematics
- Computational Mathematics
- CFD
- FFT

Programming Languages

- | | | |
|--|--|--|
| •  C | •  Julia | •  R |
| •  C++ | •  MATLAB | •  HTML |
| •  Python | •  Octave | •  CSS |
| •  TeX | •  Java | •  JS |
| •  Maple | •  Bash | •  SQL |

Libraries and Frameworks

- Numpy
- Matplotlib
- Make
- Cmake
- Pandas
- PyTorch

Tools and Platforms

- VSCode
- Neovim
- Jupyter Notebook
- Git
- SageMath

Soft Skills and Others

- Resourceful
- Innovative
- Curious
- Committed
- Persistent
- Competitive
- Ambitious
- Open-minded
- Responsible
- Problem-solving



Languages

-  **English** → Advanced (Level C1)
-  **French** → Intermediate (level B2)
-  **German** → Intermediate (level B1)
-  **Spanish** → Native
-  **Catalan** → Native



Awards and Achievements

Extraordinary Award in the Bachelor's Degree in Mathematics

November
2023



UAB
Logo

Issued by Faculty of Science, UAB



Barcelona, Spain



Spain
Flag

- Extraordinary award for the best academic record in the Bachelor's Degree in Mathematics for the 2019-2023 graduating class at the Autonomous University of Barcelona.

Master scholarship from Paris Graduate School of Mathematical Sciences

April
2023



Dauphine
Logo

Issued by Paris Graduate School of Mathematical Sciences



Paris, France



France
Flag

- Scholarship that covers tuition fees and provides a monthly stipend of 1100€ for the M2 Applied and Theoretical Mathematics program at Dauphine-PSL University.

Second-best Spanish individual Simon Marais Competition

November 2022



Simon
Marais
Logo

Issued by Simon Marais Mathematics Competition



Barcelona, Spain



Spain
Flag

- Second best qualified Spanish individual and top quartile on the west division of the 2022 Simon Marais Mathematics Competition

Best Spanish pair Simon Marais Competition

November 2021



Simon
Marais
Logo

Issued by Simon Marais Mathematics Competition



Barcelona, Spain



Spain
Flag

- Best qualified Spanish pair on the west division of the 2021 Simon Marais Mathematics Competition, jointly with [Misael Malqui](#).

Silver medal at XXX Spanish Physics Olympiad

April 2019



RSEF
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Issued by Royal Spanish Society of Physics



Salamanca, Spain



Spain
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- Obtained a Silver medal on the XXX Spanish Physics Olympiad of a total of over 200 participants from all over Spain.
- Previously selected as one of the best Catalonia participants to compete in the Spanish competition.

Honorable mention on Physics

June 2019



La
Llauna
Logo

Issued by La Llauna High School



Badalona, Spain



Spain
Flag

- Distinction awarded based on the outstanding grades obtained in Physics along the high school.



Others

Interests

-  Cycling
-  Hiking
-  Physics
-  Engineering
-  General Science
-  Swimming
-  Classical music
-  Car racing

Driving licenses

-  B