

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

Imperial College of London

October 2024 - Present

London, UK

- Working with Nektar++ software on compressible fluids.

M2 in Applied and Theoretical Mathematics

Dauphine - PSL University

September 2023 - July 2024

Paris, France

- 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

Autonomous University of Barcelona

September 2019 - July 2023

Cerdanyola, Spain

- GPA: 9.42 / 10.00
- Ranked #1 in my graduating class.
- Honors: 186 / 240 ETCS
- 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

La Llauna High School

September 2017 - May 2019

Badalona, Spain

- 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

by Imperial College London

October 2024 - Present

London, UK

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

NMK Undergraduate and Graduate Summer Camp

Nesin Mathematics Village

July 14 - July 28, 2024

Selçuk, Turkey

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

Barcelona Introduction to Mathematical Research 2023

Barcelona Graduate School of Mathematics

July 03 - July 28, 2023

Barcelona, Spain

- 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 Mesequer): *From chaotic dynamical systems to fluid turbulence*.

HackUPC 2023

by Polytechnic University of Catalonia

May 12 - May 14, 2023

Barcelona, Spain

- 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

by Aily Labs

June 11 - June 12, 2022

Barcelona, Spain

- 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

Self-employed

September 2018 - April 2023

Badalona, Spain

- Taught Mathematics, Physics and Chemistry to teenage students.

VOLUNTEERING

Trail Maintainer

August 11 - August 31, 2024

Thórsmörk, Iceland

- 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

- 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, Northern Ireland

- 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

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

February 2024 - July 2024



 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's 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

C++, Finite difference, Navier-Stokes equations

February 2024 - March 2024

 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 November 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 \(in Catalan\)](#) | [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 \(in Catalan\)](#)

- 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

C, Linear Algebra

May 2020

 [Source 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 C++ Python \LaTeX Maple Julia MATLAB Octave Java Bash R HTML CSS JS 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

Issued by Faculty of Science, Autonomous University of Barcelona

November 2023

Barcelona, Spain

- 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

Issued by Paris Graduate School of Mathematical Sciences

April 2023

Paris, France

- 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

Issued by Simon Marais Mathematics Competition

November 2022

Barcelona, Spain

- 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

Issued by Simon Marais Mathematics Competition

November 2021

Barcelona, Spain

- 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

Issued by Royal Spanish Society of Physics

Salamanca, Spain

- 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

Issued by La Llauna High School

Badalona, Spain

- 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

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