

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

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

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 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

Flame propagation, C++, Spectral methods, FFT

November 2023 - January 2024

 [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

Astrophysics, C, C++, Academic Writing

January 2023 - July 2023

 [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

Mathematics, Academic Writing

August 2020 - July 2024

[Website](#) | [Code](#)

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

Numerical simulation of the n -Body Problem

Physics, C, Python, Matplotlib

August 2022

[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

Connect 4, C, AI, Minimax

September 2022 - November 2022

[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

Mathematical Modeling, C, Music, Academic Writing

April 2021 - June 2021

[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

C, Graphs, Trees, Discrete Mathematics, Academic Writing

January 2021

[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 <i>Issued by Faculty of Science, Autonomous University of Barcelona</i> <ul style="list-style-type: none"> 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. 	November 2023 Barcelona, Spain
Master scholarship from Paris Graduate School of Mathematical Sciences <i>Issued by Paris Graduate School of Mathematical Sciences</i> <ul style="list-style-type: none"> Scholarship that covers tuition fees and provides a monthly stipend of 1100€ for the M2 Applied and Theoretical Mathematics program at Dauphine-PSL University. 	April 2023 Paris, France
Second-best Spanish individual Simon Marais Competition <i>Issued by Simon Marais Mathematics Competition</i> <ul style="list-style-type: none"> Second best qualified Spanish individual and top quartile on the west division of the 2022 Simon Marais Mathematics Competition. 	November 2022 Barcelona, Spain
Best Spanish pair Simon Marais Competition <i>Issued by Simon Marais Mathematics Competition</i> <ul style="list-style-type: none"> Best qualified Spanish pair on the west division of the 2021 Simon Marais Mathematics Competition, jointly with Misael Malqui. 	November 2021 Barcelona, Spain
Silver medal at XXX Spanish Physics Olympiad <i>Issued by Royal Spanish Society of Physics</i> <ul style="list-style-type: none"> 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. 	April 2019 Salamanca, Spain
Honorable mention on Physics <i>Issued by La Llauna High School</i> <ul style="list-style-type: none"> Distinction awarded based on the outstanding grades obtained in Physics along the high school. 	June 2019 Badalona, Spain

OTHERS

Interests	Cycling Hiking Physics Engineering General Science Swimming Classical music Car racing
Driving licenses	B