

DAVID GONZALEZ-CALATAYUD

+34 684 33 20 86 | davidgcalatayud@gmail.com | dcalatayud.github.io

RESEARCH INTERESTS

Complex Systems, Statistical Physics, Soft Matter, Biophysics, Self-Assembly, Self-Replication

EDUCATION

Autonomous University of Madrid

Sep 2020 – Jan 2025 (expected)

B.Sc. in Physics, GPA: 8.68/10

Madrid, Spain

- Relevant Courses: Computational Physics, Mathematical Methods, Statistical Mechanics, and Nonlinear Dynamics and Pattern Formation
- Bachelor thesis: Smart magnetic microrobots learn to roll with deep reinforcement learning

Boston University

Sep 2023 – Dec 2023

Visiting Student

Boston, USA

- Exchange student for Fall 2023, supported by BU-UAM's Faculty of Science Scholarship

Heidelberg University

Oct 2022 – Aug 2023

Visiting Student

Heidelberg, Germany

- Erasmus exchange student for the Academic Year 2022/23

EXPERIENCE

National Center for Biotechnology

Oct 2024 – Present

Research Assistant

Madrid, Spain

- Working on neuromorphic computing algorithms applied to biological problems.
- Supervisor: [Dr. Luis Seoane](#)

Condensed Matter Physics Center (IFIMAC)

Jan 2024 – Sep 2024

Research Assistant

Madrid, Spain

- Developed smart, magnetic-driven microrobots using deep reinforcement learning for navigation tasks, incorporating real-time control.
- Paper *in preparation*
- Supervisor: [Prof. Juan Luis Aragonés](#)

Heidelberg University

May 2023 – Aug 2023

Research Assistant

Heidelberg, Germany

- Introduced an elastic term to a phase field method of substrate-based cell motility.
- Supervisor: [Dr. Falko Ziebert](#)

RESEARCH PROJECTS

Asset Exchange Model with Economic Growth and Wealth Distribution on a Network

Oct 2023 – Dec 2023

- Applied methods of equilibrium statistical mechanics to study the wealth distribution and economic mobility in an asset exchange model across various network distributions

Study of the distribution of EV charging stations in Madrid using Voronoi diagrams

Jan 2019 – Jan 2020

- Research project under the 'Excellence' High School Program
- Developed a model using Voronoi diagrams to determine the location of electric vehicle charging stations. The model informed a city's decision on a new EV charging station location.
- Received multiple pre-university research awards, and was featured on local TV ([Telemadrid](#), in Spanish)

CONFERENCES, PRESENTATIONS AND SCHOOLS (*SCHEDULED)

*Poster, [GEFES Conference](#), Oviedo, Spain

Jan 2025

Contributed talk, [III FisEs Joven](#), Virtual

Nov 2024

Contributed talk, [2nd Spanish Soft Matter 1 1/2 Day](#), Benasque, Spain

Nov 2024

Summer School, [GEFENOL's School on Statistical Physics of Complex Systems](#), 2 weeks, Madrid, Spain

Jul 2024

AWARDS AND SCHOLARSHIPS

Interdisciplinary Mathematics Institute , 6th Prize at the VII Mathematical Modeling Contest (top 5%)	Nov 2024
Spanish National Research Council , JAE Intro Scholarship (\$4,200)	Jul 2024
GEFES-RSEF , Research Awards for Undergraduate Students (\$700)	Jun 2024
Boston University , BU-UAM's Faculty of Science Scholarship (\$4,500)	Sep 2023
Community of Madrid , Excellence Scholarship (\$2,100)	Jul 2021
Autonomous University of Madrid , Young Talent Awards	Jun 2021
Magma , 2nd Prize at the XXII Exporecerca Jove	Feb 2021
URANIA , Special Prize to the Best Project Related to Biodiversity and Environmental Protection	Jan 2021
Spanish Ministry of Universities , 2nd Prize at the XXXII Young Researchers Contest (\$4,000)	Dec 2020
Spanish Royal Physics Society , Silver Medal in the XXXI Spanish Physics Olympiad	Jul 2020
Madrid Chemistry Society , Honorable Mention in the Madrid Chemistry Olympiad	Mar 2020

VOLUNTEERING AND SERVICE

Workshop Organizer and Presenter	Jun 2024
Helped organize and present a series of talks showcasing our bachelor thesis projects to younger physics students at the Autonomous University of Madrid.	Madrid, Spain
Student Representative	2021-2022
Elected to be student representative of the 2nd-Year Physics Class.	Madrid, Spain
Physics Olympiads Tutor	2021
Mentored and trained a group of high school students to prepare for the Physics Olympiads.	Madrid, Spain

TECHNICAL SKILLS

Programming Languages: Python, MATLAB, C++
Python libraries: NumPy, SciPy, Matplotlib, NetworkX, OpenCV, Threading, Gymnasium, StableBaselines3
Others: Linux, Bash, Slurm, Git, Tmux, \LaTeX

LANGUAGE PROFICIENCY

English (fluent), **Spanish** (native), **German** (conversational)

Last updated on December 10, 2024. Certificates, references and transcripts available upon request.