

DAVID GONZALEZ-CALATAYUD

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RESEARCH INTERESTS

Soft Matter, Complex Systems, Statistical Physics, 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 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, supported by JAE Intro Scholarship.
- 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.
- Paper *in preparation*.
- Supervisor: [Prof. Juan Luis Aragonés](#)

Heidelberg University

May 2023 – Aug 2023

Research Assistant

Heidelberg, Germany

- Introduced an elastic term into a phase-field method for 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.
- Supervisor: [Prof. William Klein](#)

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

Jan 2019 – Jan 2020

- Research project under the *Baccalaureate of Excellence* High School Program.
- Developed a model using Voronoi diagrams to determine the location of electric vehicle (EV) charging stations in Madrid. 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 , 3rd Accésit at the VII Mathematical Modeling Contest [link]	Nov 2024
Spanish National Research Council , JAE Intro Scholarship (\$4,200)	Jul 2024
Condensed Matter Physics Division-RSEF , Research Awards for Undergraduate Students (\$750) [link]	Jun 2024
Boston University , BU-UAM 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 [video]	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 (\$3,000) [link]	Dec 2020
Pintor Antonio Lopez High School , Honourable Mention	Jul 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 27, 2024. Certificates, references and transcripts available upon request.