

PERSONAL INFORMATION

Raúl Molina-Prados Lallena

CURRENT POSITION

PhD student in Physics in the field of collective behaviour and active matter, Complutense University, Madrid.

PROFESIONAL EXPERIENCE

(22/01/2024 – 10/06/2024)

Teaching Assistant

“Alumno Tutor” program, Universidad Complutense de Madrid, Madrid, Spain

Support lecturer for first-year undergraduate Physics students in the course “*Fundamentals of Physics 2*”. Responsibilities included delivering 3 hours of classes per week and solving continuous assessment problem sets after each topic.

Sector: Teaching/Education

EDUCATION AND TRAINING

(20/10/2025 – On going)

PhD in Physics

EQF level 8

Universidad Complutense de Madrid, Madrid, España

Research focused on simulations of collective behaviour and active matter. Expertise in active matter and condensed matter physics.

PhD supervisor: Chantal Valeriani

(03/09/2024 – 17/06/2025)

Master’s Degree in Theoretical Physics

EQF level 7

Universidad Complutense de Madrid, Madrid, España

Final Grade: 8.30/10

Advanced knowledge of collective behaviour, active matter, mathematical analysis, stochastic equations, advanced field theory, Standard Model physics, advanced quantum mechanics, relativity, and cosmology.

Master’s Thesis: “*Analysis of Cosmological Models*”

Thesis supervisors: Javier de Cruz Pérez, Antonio López Maroto

Thesis Grade: 9.2/10

(17/09/2020 – 17/06/2024)

Bachelor’s Degree in Physics

EQF level 6

Universidad Complutense de Madrid, Madrid, Spain

Final Grade: 8.11/10

Solid background in computational physics, electrodynamics, non-equilibrium thermodynamics, statistical physics, atomic and molecular physics, optics, quantum mechanics, mathematical methods, symmetries, group theory, field theory, relativity, and cosmology.

Degree Thesis: “Cosmological perturbation theory in the Newtonian gauge”.

Thesis supervisor: Javier de Cruz Pérez

Thesis grade: 9.9/10

PERSONAL SKILLS

Native Spanish

Other languages

COMPREHENSION		SPEAKING		WRITING
Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	B2	B2
				C1

Digital skills

SELF-ASSESSMENT				
Information and data literacy	Communication and collaboration	Digital content creation	Safety	Problem solving
Advanced	Intermediate	Intermediate	Advanced	Advanced

- Advanced programming skills in Python and MATLAB for scientific applications.
- Extensive experience with Linux and Windows, including remote work environments.
- Experience with C++ and CUDA programming.
- High proficiency in LaTeX for scientific document preparation.
- Advanced command of Microsoft Office.

Driving Licence Category B

ADDITIONAL INFORMATION

- Publications
- Presentations
- Projects
- Seminars
- Workshops
- Group memberships

Presentations:

- RIALE-EU Talk: "A journey through soft matter physics and active matter".
Online presentation to high school students introducing them to collective behaviour, active matter, soft matter and condense matter.

Most recent projects:

- "On the emergence of collective order in angular dependence Vicsek Model" (working on).
We simulate an angular dependence Vicsek Model to study the collective phenomenology of the system.
- "Rheological properties through phase transition in Lennard-Jones system" (working on).
We simulate a system of Lennard-Jones attractive particles through liquid-gas transition to study its rheological properties.
- "Collective Behaviour of Fish Schools using a Vicsek-Based Model"
We proposed a new model based on Vicsek Model to simulate fishes modifying their vision cones.
- "Analysis of Cosmological Models"
We studied 5 cosmological models to see which one is the most statistically compatible with the observations.

Relevant seminars attendance:

- *LiDAR SLAM and multi-robot environments: from measure uncertainty to map fusion with CAD2SLAM.*

Relevant workshops attendance:

- "XXII GISC Workshop".
A workshop organized by the Spanish group of researchers on the field of complex systems to talk and learn about our research in complex systems and collective phenomena.

Group memberships:

- "Grupo Interdisciplinar de Sistemas Complejos" (GISC).
Spanish group of researchers on the field of complex systems.

ANNEXES

- Certificate of admission to the PhD program.
- Academic transcript corresponding to the Master's degree in Theoretical Physics.
- Document stating that I completed the Master's degree in Theoretical Physics.
- Academic transcript corresponding to the Bachelor's degree in Physics.
- Official Bachelor's degree in Physics.
- Certificate attesting to my participation in the "Alumno Tutor" program.
- Certificate explaining my teaching duties in the "Alumno Tutor" program.
- Certificate of my participation in the RIALE-EU Talk program.
- Certificate of attendance at the seminar on LiDAR and multi-robot environments.
- Certificate of attendance at the XXII GISC Workshop.

Personal Data

Autorizzo il trattamento dei miei dati personali ai sensi del Decreto Legislativo 30 giugno 2003, n. 196 "Codice in materia di protezione dei dati personali".