

Rui Zhang

London, UK

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Education

University College London — BSc Mathematics and Physics

Sep 2024 – Present

Expected graduation: Jun 2027

Relevant Coursework:

Mathematics: Complex Analysis; Mathematical Methods (including Laplace transforms, Fourier methods and PDE methods); Linear Algebra; Abstract Algebra

Physics: Classical Mechanics; Thermal Physics; Fluid Mechanics; Quantum Physics; Electricity and Magnetism; Statistical Physics

University College London — Undergraduate Preparatory Certificate for Science and Engineering

Sep 2023 - Jun 2024

Awarded A*A*A*A* (92% in Mathematics, 85% in Physics) and **Pass with Distinction**

Relevant Subjects: A Level Mathematics; A Level Further Mathematics; A Level Physics; Academic English; Science and Society

Research Interests

Interested in theoretical and computational physics, especially condensed matter and quantum many-body systems, with broader interests in mathematically structured modelling and scientific computing.

Selected Academic Projects

Year 1 Maths Summer Project in Lagrangian Mechanics — UCL Department of Mathematics

May 2025 – June 2025

- Completed a short faculty-guided summer project on Lagrangian and variational formulations of classical mechanics.
- Derived Euler–Lagrange equations for constrained systems and analyzed their relation to Newtonian dynamics.
- Applied variational methods to classical extremum problems, including the brachistochrone problem, shortest-path problems, and related minimum-energy principles.
- Produced the project in a short final presentation.

Computational Drug Design: Molecular Docking of HIV Protease Inhibitors — Department of Pharmacy, East China University of Science and Technology

SHANGHAI, CHINA

Jun 2021 – Nov 2021

- Conducted a student research project on the binding of lopinavir to HIV-1 protease using molecular docking methods.
- Built 2D/3D molecular structures and ran docking simulations in Schrödinger Maestro under multiple grid settings.
- Analyzed binding interactions and produced a final report that received **First Prize** in the 2021 Shanghai Youth Science & Innovation Workstation Competition.

Independent Research Essay: Nuclear Energy in Space Exploration — UCL Centre for Languages and International Education

Dec 2023 – May 2024

- Wrote an independent literature-based essay on the role of nuclear power systems in deep-space missions.
- Final academic paper selected by faculty as a model essay for future cohorts.

Technical Skills

Programming: Python (intermediate); basic numerical modelling and scientific computing

Scientific writing: LaTeX

Additional software: Schrödinger Maestro (molecular modelling and docking)

Languages

Mandarin (native); English (fluent)

Selected Awards

- **First Prize**, Shanghai Youth Science & Innovation Workstation Competition (2021)
- **Third Prize**, Shanghai High School Physics Texas Instruments Cup (2021)
- Qualified to participate in the **2022 Shanghai Biology Olympiad** through school- and district-level selection

Activities

- Participant, UCL AI Society machine learning tutorials
- Principal Trumpet, Shanghai Youth Activity Center Symphony Orchestra
- 1st trumpet, UCL symphony orchestra; musical theatre band
- Member, UCL Basketball Society
- Member, ADM Mathematics Society