Michał Mogielnicki | Curriculum Vitae

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Education

Trinity College Dublin — **Dublin, Ireland**
Bachelor of Arts, Theoretical Physics — *2025–present*
Awards: Top scorer (TCD, Teams) in the UK Integration Bee
Societies: Active member of MathSoc (especially problem solving)
Activities: Designing problems for the TCD integration bee

ICM, University of Warsaw — **Warsaw, Poland**
Maths for the Curious of the World — *2024*
High school program. Applied group theory to music theory

ICM, University of Warsaw — **Warsaw, Poland**
Maths for the Curious of the World - Summer School — *2022*
Programmed microcontrollers using C. Learned networking, Linux terminal commands and bash scripting

ICM, University of Warsaw — **Warsaw, Poland**
Maths for the Curious of the World — *2022*
High school program. Simulated animal's population using Python, implementing food and predator limitations. Learned about differential calculus and computational methods.

Relevant Coursework

Linear Algebra, Multivariable Calculus, Ordinary Differential Equations (ODEs), Mechanics,
Audited: Real Analysis

Research Experience

University of Warsaw — **Warsaw, Poland**
Student Researcher — *2025–2026*

- Wrote a paper detailing the sources of gravitational noise in detectors
- Developed a simulation modeling the stochastic gravitational-wave background from black hole binaries, simulating 2 to 261 galaxies per binary using Cython
- Modeled the gravitational wave background emitted by a population of 100 merging binary systems emerging over time, generating time-series data
- Developed a computational model of a binary star merger, using Pygame for visualisation, based on the luminosity formula and generate plots of the corresponding GW signal
- Studied the internal structure and the mass limits of neutron stars by numerically solving the Tolman-Oppenheimer-Volkoff (TOV) equations in Python, using NumPy for calculations and Matplotlib to visualise the functions

Ref: Tomasz Bulik

Projects

PhysLean
Formalizing Physics — *2026–present*

- Formalizing the implementation of Ideal Fluids in Lean 4.

Computer Vision controlled N-Body problem — *2025*

- Built an N-body simulation in Python, implementing the Barnes-Hut algorithm and NumPy for calculation, resulting in a decreasing computation complexity from $O(N^2)$ to O(N log N) and enabling a greater number of particles to be simulated without losing smoothness.
- Developed an interactive gesture control layer to the simulation via OpenCV and Mediapipe, allowing interactive visualisation of over 500 stars

Last updated: March 2, 2026

Volunteering

HackEurope **Dublin, Ireland**
Associate *2026*

- Collaborating with students and organizers to create a welcoming and competitive environment.
- Working on the registration and overseeing competitors.

Polish Astronomical Society **Warsaw, Poland**
Student Volunteer *2025*

- Collaborated with students and professors from the University of Warsaw to ensure the smooth proceedings of a conference for more than 200 people
- Assisted with the logistics of the event, including poster setup registration and more

Academic Partners - Warsaw IT Days (WID) **Warsaw, Poland**
Volunteer *2024–2025*

- Managed lecture halls for Data Science track (2024) and the Main Track (2025), ensuring smooth transitions between lectures and resolving technical issues
- Coordinated with speakers, attendees and organisers to maintain a professional and efficient flow

Technical Skills

Programming Languages: Python, Bash

Scientific Libraries: NumPy, Matplotlib

Tools & Technologies: Linux, Git, LaTeX

Workflow: Gentoo, Alacritty, Neovim

Languages

Polish: Native

English: Fluent

Spanish: Working Proficiency

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