Karl Nicholson

kn457@cam.ac.uk | linkedin.com/in/karl-nicholson | github.com/KarlNichlsn

EDUCATION

University of Cambridge 2025 – 2026
MPhil Data Intensive Science — Grades available from Dr. Fergusson once assessed.
Relevant Modules: Statistical Methods, Machine Learning, Research Computing, Data Driven Radio Astronomy in the SKA era, Multi Agent Reinforcement Learning & Agentic Artificial Intelligence, Cosmology

Trinity College Dublin 2020 – 2024
BA (Mod.) Honours Physics and Astrophysics — Final Grade: **High 2:1** (69%)
Received prestigious Laidlaw Undergraduate Leadership & Research Scholarship.
Entrance Exhibitioner; Undergraduate of the Year for Innovation finalist (2023).
Physics Convenor & Representative: Represented all physics students and elected Executive Board member.
Undergraduate of the Year for Innovation finalist; University Entrance Exhibitioner Award;
Relevant Modules: Mathematics for Physics 1–5, Computer Simulation 1 & 2, Statistical Thermodynamics, Cosmology, Exoplanets & Planetary Formation, Stellar & Galactic Physics

Center for Astrophysics | Harvard–Smithsonian 2023
First-Class Honours mark for thesis and capstone research project.
Utilised the Sub-Millimeter Array interferometer (angular resolution ∼1 arcsecond) to investigate the distribution and properties of Giant Molecular Clouds (GMCs) in NGC 891.
Lectures Attended: Interferometry and Imaging, Institute for Theory & Computation, ASTROAI
Research resulted in an extensive catalogue of GMCs in NGC891; GMC property variation with vertical separation from the galactic plane was investigated, submitted to AAS 245 (publication delayed).
Harvard Rugby Football Club Division 1 Athlete.

St Michael's College 2014 – 2020
Leaving Certificate Results: **613/625** points (top 1.5%)
Higher level: Physics, Chemistry, Mathematics, Applied Mathematics, English, French, Business
Award for General Excellence; Science and Chemistry Olympiad representative; Joutes Oratoires Finalist

Centre for Talented Youth Ireland & Early University Entrance 2016 – 2018
Theoretical Physics; Sports & Exercise Science; Materials & Electronics Engineering.

EXPERIENCE

Formula Trinity Autonomous — Path Planning Team Lead *Dublin, Ireland* 2022 – 2024
- Awarded the Tata Elxsi Autonomous Best Design Award at Formula Student UK (Silverstone).
- Developed a solution for an autonomous electric vehicle.
- Led Path Planning team of 5 (2023/24), utilising lidar and visual data to generate optimal racing lines.
- Conducted team meetings, delegated tasks, and managed timelines to ensure timely progress.
- Liaised with other teams to ensure compatibility and efficiency.
- Control team member (2022/23), guiding the vehicle to precise waypoints by fine-tuning output signals.

World Science Foundation — Teaching Fellow *New York, NY* 2023 – 2024
- Sponsored to undergo Laidlaw leadership-in-action project at the WSF.
- Served as teaching fellow for cosmology course developed with Nobel Laureate Dr. John Mather.
- Created a workshop for >60 exceptionally gifted students during the World Science Scholars Festival.
- Generated course materials and improved application process.
- Worked to deadlines in a corporate team environment.
- Managed logistics for an international conference with over 100 attendees.

Retainit — Design Engineer *Remote* 2025
- Iterated memory-assistant AI application to achieve product-market fit.
- Created workflow for quiz generation for partner channels, particularly physics content.
- Performed quality control on output for science channels with a combined subscriber count >40M.

Irish Low Frequency Array (I-LOFAR) — Research Student *Birr, Ireland* 2022
- Awarded funding stipend to study space weather impacts using I-LOFAR.
- Conducted a qualitative analysis on the Irish electrical grid's vulnerability to solar events.
- Presented a poster of findings at the Laidlaw Conference, London School of Economics.