

Nicoló Dalmasso

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EDUCATION

The University of Melbourne (AU)		
• Doctor of Philosophy (PhD) in Physics – Astrophysics		Mar 2022 - Sep 2025
Università degli Studi di Torino (IT)		
• MSc in Astrophysics and Theoretical Physics - 110/110 with distinction	Oct 2019 - Oct 2021	
• BSc in Physics	Oct 2016 - Oct 2019	

PROFESSIONAL EXPERIENCE

LLM Training Specialist	Sep 2025 - Present
Mercor Intelligence	
• Problem Design - Design advanced STEM reasoning problems to test frontier LLM capabilities and identify failure modes in technical reasoning.	
• Performance Analysis & Pattern Recognition - Evaluate model outputs using statistical methods to quantify reasoning gaps and error patterns, systematically tracking and categorizing failure modes to inform data-driven improvements.	
• Solution Development & Evaluation - Develop step-by-step solutions with detailed rubrics for evaluating model responses, establishing correct reasoning pathways and measurable success criteria for state-of-the-art technical problems.	
• Quality Assurance - Validate model accuracy through expert review and statistical analysis, ensuring evaluation frameworks maintain consistency and reliability across diverse problem categories.	
Doctoral Researcher	Mar 2022 - Sep 2025
The University of Melbourne	
• Data Engineering & Analysis - Developed automated Python pipelines for processing heterogeneous datasets, reducing manual processing time by 70% and enabling efficient extraction of insights from complex data.	
• Data Visualization & Communication - Produced publication-quality visualizations of complex datasets using Python, translating technical findings into clear narratives for diverse audiences.	
• Machine Learning & Statistical Modeling - Built probabilistic models (Bayesian inference, MCMC) and feature extraction pipelines, improving benchmark accuracy by 15% using ensemble methods and rigorous statistical validation.	
• Algorithm Optimization - Reduced computational runtime by 40% through profiling and code optimization, enabling production-scale deployment of analysis workflows.	
• Research Leadership & Collaboration - Led two large-scale international collaborations and contributed to five additional projects, delivering 7 peer-reviewed publications (5 first-author, 2 co-author) in Nature Astronomy and leading journals.	
Teaching Assistant	Mar 2022 - Sep 2025
The University of Melbourne	
• Teaching & Mentorship - Conducted tutorials and lectures for undergraduate and graduate courses in Physics and Astrophysics, translating complex scientific concepts into accessible explanations for diverse student audiences.	
• Assessment & Performance Analysis - Evaluated assignments, projects and exams for 200+ students, tracking grade distributions and assessment outcomes to ensure grading consistency and identify opportunities for targeted student support.	
• Curriculum Development - Co-delivered Year 12 Physics lessons through SEAMS University outreach program, adapting technical content for high school audiences.	

TECHNICAL SKILLS

- **Data Engineering:** ETL pipelines, feature engineering, workflow automation, performance optimization.
- **Data Analysis:** Exploratory analysis (EDA), data visualization, anomaly detection, high-dimensional data processing.
- **Programming & Tools:** Python (NumPy, Pandas, Matplotlib, SciPy), SQL, Git/GitHub, Docker.
- **Statistical Modeling:** Bayesian inference, MCMC simulations, probabilistic modeling, hypothesis testing.
- **ML Techniques:** Supervised/unsupervised learning, neural networks, model training and fine-tuning, cross-validation, A/B testing.
- **AI Tools:** LLM evaluation, prompt engineering, GenAI platforms (GPT, Claude).