Mary Letey

email + gscholar + github

Education

Sept 2023 — June 2028	**Harvard University**	PhD Candidate — **Applied Mathematics**
Sept 2022 — June 2023	**Perimeter Institute**	MSc — **Theoretical Physics**
Sept 2018 — June 2022	**University of Cambridge**	BA Honours — **Mathematics**

Publications & Preprints

Pretrain–Test Task Alignment Governs Generalization in In-Context Learning
Under Submission at ICLR2026 — arxiv preprint
'What Can('t) Transformers Do' Workshop, Neurips 2025
ML, Zavatone-Veth, Lu, Pehlevan

Theory of Scaling Laws for In-Context Regression: Depth, Width, Context and Time
Under Submission at ICLR2026 — arxiv preprint
Bordelon, **ML**, Pehlevan

Asymptotic theory of in–context learning by linear attention
Proceedings of the National Academy of Sciences (2025)
'Mathematics of Modern Machine Learning' Workshop, Neurips 2024
Lu, **ML**, Zavatone-Veth, Maiti, Pehlevan

Quantum initial conditions for curved inflating universes
Physical Review D (2024)
ML*, Shumaylov*, Agocs, Handley, Hobson, Lasenby

Research & Work Experience

Hudson River Trading — Winter 2026
Research Internship — Machine learning for market prediction

Quebec Artificial Intelligence Institute (MILA) — Summer 2023
Research Internship — Equivariant architectures for neural PDE solvers

Perimeter Institute for Theoretical Physics — 2022-2023
Master's thesis — Classification of discrete symmetries in non-Euclidean space

Perimeter Institute Quantum Intelligence Lab — Fall 2022
Graduate Rotation — Machine learning for quantum wavefunction prediction

Cavendish Laboratory & **Kavli Institute for Cosmology, Cambridge** — Summer 2022
Research Internship — Research on early-universe cosmology and curved spacetimes

Embryo Ventures — Summer 2020
Internship — Due diligence and founder outreach

Iguana Investments — Fall 2019-Spring 2020
Research Internship — Market prediction models

Awards & Funding

2025	**Graduate Fellowship**	Kempner Institute — Full support for graduate studies
2024	Clare Marie Doris Innovation Fund	Harvard University
2023	Graduate Prize Fellowship	Harvard University
	Summer Research Bursary	McGill University
2022	**International Scholar Award**	Perimeter Institute — Full support for MSc
	Summer Research Bursary	Royal Society