Matthew Quenneville, PhD

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Experience

Graduate Student Researcher *University of California, Berkeley* 2018-2022

- Made substantial contributions to galaxy modeling methods resulting in 4x more accurate determinations of galaxy shapes and a 2x speedup
- Contributed to an improved parameter search strategy based on machine learning, reducing computation time by 10x (Gaussian process regression)
- Utilized Bayesian modeling to infer relationships between galaxy properties
- Generated Monte Carlo simulations of galaxy observations to validate models
- Supervised undergraduate student research projects including an Honors Thesis
- Communicated results through publishing papers and giving talks and seminars
- Weighed a black hole 3 billion times heavier than the sun, and measured the shape of its host galaxy - the most massive black hole where such a measurement has been made

Graduate Student Instructor *University of California, Berkeley*

- Taught electromagnetism and thermodynamics to science and engineering students 2016-2018
- Awarded an Outstanding Graduate Student Instructor award for exceptional teaching
- Consistently outperformed the department average on student evaluations for overall effectiveness as an instructor with an average score of 6.35/7

Undergraduate Researcher *Simon Fraser University/CERN* 2012-2014

- Sped up existing techniques for Higgs Boson mass estimation for a specific decay channel by about 1500x using machine learning (boosted regression trees)
- Engineered input features for machine learning models leading to an increase in classification accuracy of 4% for particle decays (boosted decision trees)
- Won a CERN summer student fellowship to perform research with the ATLAS collaboration at CERN in Geneva, Switzerland

Technical Skills

Data Analysis	Python	Computing	Mathematics	Physics
● Machine learning	● NumPy	● Git	● Statistics	● Electromagnetism
● Bayesian inference	● Scikit-learn	● Linux	● Linear algebra	● Statistical Mechanics
● Regression	● Pandas	● Fortran	● Calculus	● Thermodynamics
● Data visualization	● TensorFlow	● SQL	● Information theory	● Quantum Mechanics

Education

PhD Physics *University of California, Berkeley* (GPA: 4.0 / 4.0) 2016-2022

- Awarded NSERC Postgraduate Scholarship ($73,000 CAD)

BSc Honours Mathematical Physics *Simon Fraser University* (GPA: 4.23 / 4.33) 2011-2016

- Awarded Physics Charter Faculty Prize (Top graduating student in any physics major)
- Awarded Gordon M. Shrum Entrance Scholarship ($24,000 CAD)

Peer-reviewed Publications

- 3 first author publications; 7 total publications (view on Google Scholar)