

# Matthew Quenneville

[mattq1@gmail.com](mailto:mattq1@gmail.com) • [mattq.ca](http://mattq.ca) • [linkedin.com/in/mquenneville](https://linkedin.com/in/mquenneville) • [github.com/MatthewQuenneville](https://github.com/MatthewQuenneville)

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## Education

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- Ph.D. Physics**, UC Berkeley. (GPA: 4.0/4.0) 2016-2022
- Awarded NSERC Postgraduate Scholarship (\$73,000 CAD)
- B.Sc. 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)

## Experience

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- Graduate Student Researcher**, UC Berkeley 2018-2022
- Made substantial contributions to galaxy modeling methods resulting in ~4x more accurate determinations of galaxy shape and a ~2x speedup
  - 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
  - Contributed to an improved parameter search strategy based on a surrogate Gaussian process regression model, reducing computation time by ~10x
  - Generated Monte Carlo simulations of galaxy observations to validate models
  - Utilized Bayesian modeling to infer relationships between galaxy size, brightness, and stellar velocity dispersions
  - Supervised undergraduate student research projects including an Honors Thesis
  - Communicated results through publishing papers and giving talks and seminars
- Graduate Student Instructor**, UC Berkeley 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
- Honours Thesis**, Simon Fraser University 2015-2016
- Used analytic and numerical techniques to elucidate the relationship between learning rate and energetic efficiency, leading to publication in a peer-reviewed journal
- Undergraduate Researcher**, Simon Fraser University/CERN 2013-2015
- 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 leading to an increase in high energy particle decay product classification accuracy of 4% (Boosted Decision Trees)
  - Won a CERN summer student fellowship to perform research with the ATLAS collaboration at CERN in Geneva, Switzerland.

## Technical Skills

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- Python (NumPy, SciPy, Matplotlib, scikit-learn, TensorFlow, pandas, PyMC), computing (Unix shell, Git, Fortran, LaTeX, SQL), data analysis (bayesian modeling, machine learning, data visualization), math (statistics, linear algebra, calculus, information theory), physics (astrophysics, statistical mechanics)

## Peer-reviewed Publications

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