

# Matthew Quenneville, PhD

[mquenneville@berkeley.edu](mailto:mquenneville@berkeley.edu) • [mattq.ca](https://mattq.ca) • [linkedin.com/in/mquenneville](https://linkedin.com/in/mquenneville) • [github.com/MatthewQuenneville](https://github.com/MatthewQuenneville)

## Experience

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

- Improved galaxy modelling methods resulting in 4x more accurate determinations of galaxy shapes and a 2x reduction in computation time
- Contributed to an improved parameter optimization strategy based on machine learning, reducing computation time by 10x (Gaussian process regression)
- Extracted scientific insights from high resolution multispectral and hyperspectral images
- Utilized Bayesian modelling to infer relationships between galaxy properties
- Generated Monte Carlo simulations of galaxy observations to validate models
- Led research projects involving international teams of collaborators
- Mentored students conducting research projects including an Honours Thesis

**Graduate Student Instructor** *University of California, Berkeley* 2016-2018

- Taught electromagnetism and thermodynamics to science and engineering students
- 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** *Canadian Institute for Theoretical Astrophysics* Summer 2015

- Wrote an analysis pipeline for data from interferometric arrays of radio telescopes
- Performed high resolution studies of pulsar emission variability

**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

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Data Analysis	Python	Computing	Mathematics	Physics
<ul style="list-style-type: none"><li>• Machine learning</li><li>• Bayesian inference</li><li>• Regression</li><li>• Classification</li></ul>	<ul style="list-style-type: none"><li>• NumPy</li><li>• Scikit-learn</li><li>• Pandas</li><li>• TensorFlow</li></ul>	<ul style="list-style-type: none"><li>• Git</li><li>• Linux</li><li>• Fortran</li><li>• SQL</li></ul>	<ul style="list-style-type: none"><li>• Statistics</li><li>• Linear algebra</li><li>• Calculus</li><li>• Information theory</li></ul>	<ul style="list-style-type: none"><li>• Electromagnetism</li><li>• Thermodynamics</li><li>• Quantum Mechanics</li><li>• Astrophysics</li></ul>

## Education

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

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