# Daniel Barter


- Date of Birth: November 27, 1989
- Place of Birth: Melbourne, Australia
- Citizenship: Australia
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## Education

- B.Sc with First Class Honours and University Medal, Pure Mathematics, University of Sydney, 2008-2011.
- PhD, Pure Mathematics, University of Michigan, 2012 - 2017. Specialized in category theory and representation theory.
- I like to think about:
  - Pure Mathematics: differential geometry, representation theory and category theory: I am particularly interested in the interaction between these subjects and physics. Recently, I have been thinking about the relationship between tensor categories, classical representation theory and and topological quantum computing.
  - Statistical Inference: discriminative and generative models, inference algorithms (MAP estimation, MCMC, variational methods): Machine learning is popular right now. I have been spending some time learning about the mathematical foundations of the subject. I don't know all the folklore that goes into building effective non linear classifiers, but I understand the meaning of words like neural network, autoencoder, generative model and KL-divergence.
  - Computer Science: functional programming, compilers, UNIX: In 2015 I started reading SICP which got me interested in computer science. Since then I have solved most of the exercises. I have also been reading Compiler Design: Virtual Machines which explains the operational semantics of several different programming languages. I have been using GNU/Linux as my main operating system since 2012 and am acquainted with the standard tools and how to combine them.

## Preprints

- Noetherianity and rooted trees. arXiv:1509.04228
- A remark about 6j symbols and young semi-normal form. arXiv:1610.05248
- Computing the minimal model for the quantum symmetric algebra. arXiv:1610.05204
- Eigenvalues of rotations and braids in spherical fusion categories. Joint with Corey Jones and Henry Tucker. arXiv:1611.00071

## Invited Talks

- Michigan theoretical computer science seminar, *Tensor rank and stability in representation theory*
- Berkeley combinatorics seminar, *Combinatorial categories, configuration spaces and tensorial species*

## Teaching

- Tutor, MATH1001 (Differential Calculus), Sem 1, 2011, University of Sydney
- Tutor, MATH1003 (Integral Calculus and Modeling), Sem 2, 2011, University of Sydney
- Tutor, MATH1901 (Differential Calculus - Advanced), Sem 1, 2012, University of Sydney
- Graduate Student Instructor, Math 115 (Calculus 1), Fall 2012, University of Michigan
- Graduate Student Instructor, Math 115 (Calculus 1), Winter 2013, University of Michigan
- Graduate Student Instructor, Math 215 (Calculus 3), Fall 2013, University of Michigan
- Graduate Student Instructor, Math 116 (Calculus 2), Winter 2014,University of Michigan

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- Graduate Student Instructor, Math 116 (Calculus 2), Fall 2016, University of Michigan