

MATTHEW BURKE

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EDUCATION

- 2011-2015 **PhD Mathematics, Macquarie University, Sydney**
Analysed the problem of integrating Lie algebroids in theoretical physics, identified its key components, designed and built an abstract framework extending and simplifying the theory.
- 2010-2011 **Part III Mathematics (MMath), Christ's College, University of Cambridge**
Pass with Merit.
Part III Essay scored 95/100.
- 2007-2010 **Bachelor's Degree in Mathematics (BA), Christ's College, University of Cambridge**
Upper Second Class Honours.
Completed seven optional computational projects all of which gained alpha quality marks.
Christ's College Whelan Prize in 2008 for First Class Examination Performance.

WORK EXPERIENCE

- 2016.11-Present **Chief Technology Officer at MathSpire Ltd**
Extended existing course structure and developed new courses for A-level mathematics students. Used F#, JavaScript, the .NET framework and the Xamarin Framework to create desktop and mobile applications.
- 2016.06-2016.11 **Software Developer and Content Creator at MathSpire Ltd**
Created database of mathematics videos, tests and graphics using F# and SQL.
- 2015.10-11 **Visiting Postdoctoral Researcher, Masaryk University, Brno**
Plenary speaker at the multi-disciplinary Eduard Čech Institute Workshop.

TEACHING EXPERIENCE

- 2016.07-08 **Tutor at Debate Chamber Mathematics Summer School**
Guided A-level students through undergraduate level mathematics topics including Linear Algebra, Analysis, Differential Equations, Turing Machines, Infinity and Cryptography.
- 2013-2014 **Tutor for Macquarie University**
Demonstrated solutions on the whiteboard for three undergraduate mathematics courses.
- 2012 **Tutor at Macquarie University Numeracy Centre**
Guided and motivated first year students individually and in small groups at the drop-in centre.
- 2010.06 **GCSE Tutor for Blue Tutors**

PUBLICATIONS AND PREPRINTS

- 2016.06.29 *Ordinary Connectedness Implies Internal Connectedness and Integrability for Lie Groupoids*
Symmetry, Integrability and Geometry: Methods and Applications
Accepted Pending Corrections (<http://arxiv.org/abs/1606.06120>)
- 2016.11.14 *A Synthetic Version of Lie's Second Theorem*
Submitted to Applied Categorical Structures (<http://arxiv.org/abs/1605.06378>)

COMMUNICATION AND TECHNICAL SKILLS

- **Presentational:** Presented at the international conference 'Category Theory 2014' to an audience of about 40 and also at seminars in Australia, Canada, the Czech Republic, France and the United Kingdom.
- **Programming Languages:** 8+ years of experience using LaTeX to present technical work and take notes. C, C++ and Haskell programming languages and GiNaC C++ library used in undergraduate computational projects. GitHub account at: <https://github.com/mwpb>.
- **Online Courses:** Using Python to Access Web Data by the University of Michigan on Coursera. Certificate earned on February 28, 2016. Passed with score of 99.3%. Using Databases with Python by the University of Michigan on Coursera. Certificate earned on May 10, 2016. Passed with score of 98.9%.
- **Operating Systems:** Windows 10 (current), Macintosh OS X, Arch Linux and Fedora operating systems.