

✉ jeffrey.c.morton@theoreticalatlas.net🌐 www.theoreticalatlas.net**RESEARCH INTERESTS**

Topological Quantum Field Theory, Category Theory, Groupoids, Representation Theory,
Low-Dimensional Topology, Combinatorics

EDUCATION

- June 2007** PhD in Mathematics – Thesis Title *Extended TQFTs and Quantum Gravity*
University of California, Riverside, USA – Thesis Advisor, John Baez
- February 2001** M.Sc. in Mathematics - Thesis Title: *Existence and Nonexistence Theorems for Solutions to the Einstein-Dirac-Maxwell Equations*
McGill University, Montreal, Canada – Thesis Advisor, Niky Kamran
- June 1998** B.Math - Double Major in Honours Pure Math, Honours Combinatorics & Optimization
University of Waterloo, Waterloo, Canada
- President of the *Pure Math Club*: organized club activities, arranged faculty and invited talks, and organized a “conference” series of short student talks.

WORK EXPERIENCE

- June 2016** **Assistant Professor**
- present **SUNY Buffalo State** (Buffalo, USA)
- Taught Topics in Modern Algebra (summer session)
- August 2015** **Visiting Assistant Professor**
- May 2016 **University of Toledo** (Toledo, USA)
- Taught Mathematics for Liberal Arts (Fall 2015), Mathematical Modelling and Problem Solving (Fall/Winter 2015 – 4 sections), and its freshman success class, Study Skills for Math 1200 (Fall 2015), using “Flipped” classrooms and other innovative pedagogy
 - Colloquium - University of Toledo Mathematics Department: “Topological Quantum Field Theory and Frobenius Algebras” (November 2015)
- August 2014** **McCain Teaching Postdoc**
- July 2015 **Mount Allison University** (Sackville, Canada)
- Taught Linear Algebra (Fall 2014), Multivariable Calculus (Fall 2014), Probability and Statistics (Winter 2015)
 - Assisted undergrad students in preparation for the Putnam Mathematics Competition
- September 2012** **Postdoctoral Researcher, Graduiertenkolleg/Research Training Group 1670**
- August 2014 **Universität Hamburg** (Hamburg, Germany)
- Co-taught a course for graduate students entitled Topics in Category Theory For Geometry (Spring 2013)
 - Co-organizer of half-semester seminar series on Infinity-n Categories, for Research Seminar of Christoph Schweigert, Ingo Runkel, Christoph Wockel
 - Mentored graduate students with research projects
- September 2010** **Postdoctoral Researcher, CAMGSD**
- September 2012 **Instituto Superior Técnico** (Lisbon, Portugal)
- On the organizing committee for the workshop *Higher Gauge Theory, TQFT and Quantum Gravity*, held at IST February 2011

- July 2007
- June 2010
- Postdoctoral Fellow and Assistant Professor**
University of Western Ontario (London, Canada)
- Taught Introduction to Linear Algebra (Fall 2008, Fall 2009), Complex Variables (Winter 2008, Winter 2009), Topology (Fall 2007)
 - Organized a Seminar on Stacks, Groupoids and Algebras in 2009-2010
- September 2002
- June 2007
- Graduate Teaching Assistant (2002 - 2007)**
Teaching Associate in Mathematics (2004 - 2006)
University of California, Riverside (Riverside, USA)
- TA'd Precalculus (regular and for Life Sciences), First Year Calculus parts A,B, C (regular and for Business), Multidimensional Calculus parts A, B, Linear Algebra (Advanced, and for Business), Introduction to Differential Equations, and Set Theory
 - Taught Introduction to Discrete Structures (Summer 2005/2006), Complex Analysis Qualifying Exam Seminar (Spring 2005), First Year Calculus Part C (Summer 2004) as Teaching Associate
 - Mentor to new Graduate Teaching Assistants in UC Riverside Math Department
- Fall 2001
- Lecturer**
McGill University (Montreal, Canada)
- Taught Vectors, Matrices and Geometry (Fall 2001)
 - Taught 1st year Calculus as TA
- Summer 2001
- Fall 2002
- Lecturer**
Dawson College (Montreal, Canada)
- Taught Precalculus (Summer 2002) and Calculus II (Summer 2001)
- Other
- Outside Academia**
- **The Lisbon Players** (Lisbon, Portugal): Volunteer at a non-profit, English theatre. Painted the stage, tended bar, was Narrator in "The Happy Prince" (2011-2012)
 - **HBE** (Montreal, Canada): Internet programming in Perl and SQL (Part time 1999-2000)
 - **Open Text** (Waterloo, Canada): Developed experimental search-engine algorithms using Perl (2 One-Semester Co-op Work Placements, 1996-1997)
 - **RIM** (Waterloo, Canada): Testing, mathematical programming for cryptography and signal processing using C, chip-specific assembler language (3 One-Semester Co-op Work Placements, 1994-1996)
 - **Revenue Canada** (Ottawa, Canada): Statistical programming in mainframe environment (Co-op Work Placement, 1994)

RESEARCH & PUBLICATIONS

Projects www.theoreticalatlas.net: a record of thoughts that arise from my research, experiences as a mathematician, and whatever else I find interesting to share

Select Articles
Please see Annexes for a more extensive list

- "The Categorified Heisenberg Algebra I: A Combinatorial Representation", arXiv:1207.2054 (with Jamie Vicary), submitted to *Journal of Pure and Applied Algebra* (requested changes submitted, final approval pending) (45 pages)
- "Transformation Double Categories Associated to 2-Group Actions", arXiv:1401.0149 (with Roger Picken), accepted by *Theory and Applications of Categories*, 2015 (40 pages)
- "Cohomological Twisting of 2-Linearization and Extended TQFT", accepted by *Journal of Homotopy and Related Structures*, 2012, (54 pages)
- "2-Vector Spaces and Finite Groupoids", *Applied Categorical Structures*, vol 19, no. 4 pp 659-707, 2010 (44 pages)
- "Double Bicategories and Double Cospans", *Journal of Homotopy and Related Structures*, vol 4, no. 1, 2009 (35 pages)
- Categorified Algebra and Quantum Mechanics", *Theory and Applications of Categories*, vol 16, pp 785-854, 2006 (68 pages)

SERVED AS REFEREE FOR...

- *Differential Geometry and its Applications*
- *Journal of Mathematics Physics*
- *Letters in Mathematical Physics*
- *Science China Mathematics*

OTHER SERVICE

University of Toledo
Mount Allison University

Universität Hamburg

Instituto Técnico Lisboa

**University of Western
University of California
University of Waterloo**

- Taught the freshman success class, Study Skills for Math 1200 (Fall 2015)
- Assisted undergrad students in preparation for the Putnam Mathematics Competition
- Co-organizer of half-semester seminar series on Infinity-n Categories
- Mentored graduate students with research projects
- Co-organizer of 2012 GRK1670 TQFT Research Seminar
- Organizing Committee for *Higher Gauge Theory, TQFT and Quantum Gravity* workshop at IST February 2011
- Organized a Seminar on Stacks, Groupoids and Algebras in 2009-2010
- Mentor to new Graduate Teaching Assistants in UC Riverside Math Department
- President of the *Pure Math Club*: organized club activities, arranged faculty and invited talks, and organized a “conference” series of short student talks.

GRANTS & FUNDING

- Travel support for attending numerous conferences, research visits, and residencies as noted above
- **New Geometry and Topology Project**: participant in project funded by Portuguese Foundation for Science and Technology (FCT) for which funding was renewed
- **Graduierntenkolleg/Research Training Group 1670**: contributed documentation towards successful funding review

SUMMARY OF TEACHING EDUCATION & EXPERIENCE

Pedagogic Training

**Graduate/Upper Level
Courses Given**

**Undergraduate Courses
Given**

- **Apprentice Teaching Course** University of California, Riverside (UCR) 2002-2007
- **Topics in Modern Algebra** SUNY Buffalo State, Summer 2016
- **Topics in Category Theory for Geometry** Universität Hamburg, 2013
- **Topology** University of Western Ontario, 2007
- **Complex Analysis Qualifying Exam Seminar** UCR, 2005
- **Mathematics for Liberal Arts** University of Toledo, Fall 2015
- **Mathematical Modelling and Problem Solving** University of Toledo, Fall/Winter 2015
- **Probability and Statistics 2** Mount Allison University, Winter 2015
- **Multivariable Calculus** Mount Allison University, Fall 2014
- **Linear Algebra** Mount Allison University, Fall 2014
- **Complex Variables** University of Western Ontario, 2008-2009
- **Introduction to Linear Algebra** University of Western Ontario, 2008-2009
- **Introduction to Discrete Structures** UCR, 2005-2006
- **First Year Calculus Part C** UCR Summer 2004
- **Precalculus** Dawson College Spring/Summer 2002
- **Vectors, Matrices, and Geometry** McGill University Fall 2001
- **Calculus II** Dawson College Spring/Summer 2001

CONFERENCES & VISITS

Research Visits

- **Invited residence at Erwin Schrödinger Institute**, Vienna, Austria, February 2014
- Dany Majard; **Masaryk University**, Brno, Czech Republic (invited to University of Hamburg), November 2013
- John Huerta; **Instituto Superior Técnico**, Portugal (invited to University of Hamburg), June 2013
- Roger Picken; **Instituto Superior Técnico**, Portugal, November 2012 and September 2013
- Jiri Rosicky, Dany Majard; **Masaryk University**, Brno, Czech Republic, December 2012
- Chenchang Zhu; **Göttingen University**, Göttingen, Germany, 2011 and February 2012
- Tim Porter et. al.; **Cardiff University**, Wales, May 2011
- Jamie Vicary; **Oxford University**, Oxford, England, May 2011
- Roger Picken; *TQFT Club Seminar*, **Instituto Superior Técnico**, Lisbon, Portugal, July 2010
- Derek Wise; **University of California, Davis**, April 2010
- Dorette Pronk; *Atlantic Category Theory Seminar*, **Dalhousie University**, Halifax, Canada, August/September 2009
- Derek Wise, for *String Theory and Quantum Gravity Seminar*, **University of California, Davis**, March 2008
- **Short-Term Visitor at Perimeter Institute**, Waterloo, Canada, June-July 2006

Presented at...

- *Atlantic Canada Category Theory Seminar*, Dalhousie University, Halifax, Canada, October 2014-February 2015
- *Groupoidfest 2014*, University of Colorado Boulder, November 2014
- *Modern Methods in Topological Quantum Field Theory*, Vienna, Austria, February 2014
- *Workshop on Higher Gauge Theory and Higher Quantization*, Edinburgh, Scotland, June 2014
- *XXII International Fall Workshop on Geometry and Physics*, Evora, Portugal, September 2013
- Invited minicourse *Higher Structures in China 3*, Jilin University, Changchun, China, August 2012
- *Workshop on Representation Theoretical and Categorical Structures in Quantum Geometry and Conformal Field Theory*, Erlangen, Germany, October 2011
- *Quantum Theory and Gravitation*, Zurich, Switzerland, 2011
- *Higher Structures 2011*, Georg-August-Universität Göttingen, Germany, November 2011
- *Higher Gauge Theory, TQFT, and Categorification*, Cardiff University, Wales, May 2011
- *Higher Structures in Geometry and Topology V*, Hamburg, Germany, May 2011
- *Higher Gauge Theory, TQFT, and Quantum Gravity*, Instituto Superior Técnico, Lisbon, Portugal, February 2011
- *Oporto Meeting on Geometry, Topology and Physics*, Faro, Portugal, July 2010
- *Biannual Philosophy of Science Association Meeting*, Montreal, Canada, November 2010
- *Connections in Geometry and Physics*, Perimeter Institute, Waterloo, Canada, May 2009
- *Groupoidfest 08*, University of California, Riverside, November 2008
- *Quantum Gravity and Quantum Geometry 2008*, University of Nottingham, England, July 2008
- *Ottawa Mathematics Conference*, University of Ottawa, Canada, May 2008
- *Groupoidfest 07*, University of Iowa, November 2007
- *23rd Pacific Coast Gravity Meeting*, California Institute of Technology, March 2007
- *International Category Theory Conference*, White Point, Canada, June 2006
- *Union College Mathematics Conference*, Schenectady, NY, December 2005
- Poster at *LOOPS '05*, Max Planck Institute, Potsdam, Germany, October 2005

Other Conferences Attended

- *Category Theory 2015*, Aveiro, Portugal, June 2015
- *Categorical Methods at the Crossroads*, Schloss Dagstuhl – Leibniz Center for Informatics, Germany, April 27-May 2 2014
- *Modern Methods in Topological Quantum Field Theory*, Erwin Schrödinger Institute, Vienna, Austria, February 2014
- *New Directions in Topological Quantum Field Theory*, Universität Hamburg, Germany, August 2012
- *Categories, Quanta, Concepts*, Perimeter Institute, June 2009
- *Barrett Lectures*, University of Tennessee, Knoxville, May 2006
- *CBMS Conference on the Geometrical Study of Differential Equations*, Howard University, Washington DC, June 2000