

Curriculum Vitae

for

Jeffrey Colin Morton

Professional Address

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Citizenship: Canadian

Languages: English, French (fluent), Portuguese (basic)

Research Interests: Category theory, TQFT, Groupoids, Representation Theory, Cohomology, Geometric Topology, Mathematical Physics, Combinatorics

Current Position

- ◆ Postdoctoral Researcher, Instituto Superior Técnico, Portugal (Sept 2010-present)

Education

- ◆ Ph.D in Mathematics, University of California, Riverside (June 2007)
 - ◆ *Thesis Advisor:* John Baez
 - ◆ *Thesis Title:* Extended TQFTs and Quantum Gravity
- ◆ M.Sc. in Mathematics, McGill University (Feb 2001)
 - ◆ *Thesis Advisor:* Niky Kamran
 - ◆ *Thesis Title:* Existence and Nonexistence Theorems for Solutions to the Einstein-Dirac-Maxwell Equations
- ◆ B.Math Double Major in Honours Pure Math and Honours Combinatorics & Optimization, University of Waterloo (June 1998)

Previous Positions

- ◆ Postdoctoral Fellow, University of Western Ontario (July 2007-Jun 2010)
- ◆ Graduate Teaching Assistant, UC Riverside, Sept 2002 - Jun 2007
- ◆ Teaching Associate in Mathematics, UC Riverside, 2004-2006
- ◆ Lecturer, McGill University, Fall 2001
- ◆ Lecturer, Dawson College (Montreal), Summer 2001-2002

Publications and Papers

- ◆ Categorized Algebra and Quantum Mechanics; Theory and Applications of Categories, vol 16, pp 785-854, 2006
- ◆ Double Bicategories and Double Cospans; (Journal of Homotopy and Related Structures, vol 4, no. 1)
- ◆ 2-Vector Spaces and Groupoids; Applied Categorical Structures (DOI: 10.1007/s10485-010-9225-0)
- ◆ Extended TQFT, Gauge Theory, and 2-Linearization; available as arxiv:1003.5603 (submitted to Journal of Topology)
- ◆ Groupoidification and Khovanov's Categorification of the Heisenberg Algebra (with Jamie Vicary; in progress)
- ◆ Extended TQFT in Hilbert Bimodules (with Derek Wise; in progress)
- ◆ Higher Gauge Theory and Transformation 2-Groupoids (with Roger Picken; in progress)

Research Visits

- ◆ Chenchang Zhu and Weiwei Pan, Universitat Gottingen, for seminar, Nov 2011
- ◆ Derek Wise, University of Erlangen/Nuremburg for seminar, Oct 2011
- ◆ Tim Porter et. al., Cardiff University, May 2011
- ◆ Jamie Vicary, Oxford University, May 2011
- ◆ Roger Picken, TQFT Club Seminar, Instituto Superior Tecnico, Portugal, July 2010
- ◆ Derek Wise, University of California, Davis, April 2010
- ◆ Dorette Pronk, Atlantic Category Theory Seminar, Dalhousie University, Halifax, Nova Scotia, Canada, Aug/Sept 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

Conference Talks

- ◆ “Extended TQFT in a Bimodule 2-Category”, presented at Representation Theoretical and Categorical Structures in Quantum Geometry and Conformal Field Theory, Universität Erlangen-Nürnberg, Oct 2011
- ◆ “Two Approaches to Categorification of the Heisenberg Algebra and their Relations”, presented at Higher Structures in Mathematics and physics, Nov 2011, Universität Göttingen, Germany
- ◆ “Extended TQFT from (Higher) Gauge Theories”, presented at Higher Gauge Theory, TQFT, and Quantum Gravity, Feb 2011; Higher Gauge Theory, TQFT, and Categorification, Cardiff University, May 2011; Higher Structures in Geometry and Topology V, May 2011
- ◆ “2-Linearization in Topology and Physics”, presented at Oporto Meeting on Geometry, Topology and Physics in Faro, Portugal, July 2010
- ◆ “Groupoidification in Physics”, invited talk in special session on Category Theory at biannual Philosophy of Science Association meeting, Montreal, Nov 2010
- ◆ "2-Vector Spaces and Groupoids", presented at Groupoidfest 07, University of Iowa, November 2007; Ottawa Mathematics Conference, University of Ottawa, Canada, May 2008; Octoberfest 2008, Concordia University, Montreal, Canada, October 2008
- ◆ "Extended Topological Quantum Field Theories and 3D Quantum Gravity", presented at 23rd Pacific Coast Gravity Meeting, Pasadena, California, March 2007; Quantum Gravity and Quantum Geometry 2008, Nottingham, England, July 2008
- ◆ "Higher Algebra, Extended TQFT's and Quantum Gravity" talk presented at at Perimeter Institute, Waterloo, Ontario, Canada, July 2006
- ◆ "Categorifying the Quantum Harmonic Oscillator", talk presented at: International Category Theory Conference, White Point, Nova Scotia, Canada, June 2006; Union College Mathematics Conference, Schenectady, NY, December 2005; UC Riverside (Qualifying Exam Talk)
- ◆ "2D and 3D TQFT's and Higher Dimensional Algebra" (poster): presented at LOOPS '05 at Albert Einstein Institut für Gravitationsphysik, Potsdam, Germany, October 2005

Courses Taught As Primary Instructor

University of Western Ontario

- ◆ Introduction to Linear Algebra - Fall 2008, Fall 2009
- ◆ Complex Variables - Winter 2008, Winter 2009
- ◆ Topology - Fall 2007

UC Riverside

- ◆ Introduction to Discrete Structures - Summer 2005 and 2006
- ◆ Complex Analysis Qualifying Exam Seminar, Spring 2005

- ◆ First Year Calculus, Part C - Summer 2004

Dawson College, Summer 2001 - 2002

- ◆ Precalculus
- ◆ Calculus II

McGill, Fall 2001

- ◆ Vectors, Matrices and Geometry

Courses Taught as Teaching Assistant

UC Riverside, 2002-2006

- ◆ 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
- ◆ Set Theory

McGill, 1998-2000

- ◆ 1st year calculus

Service & Communication

- ◆ Co-organizer of conference "Higher Gauge Theory, TQFT, and Quantum Gravity", Instituto Superior Tecnico, Portugal, Feb 2011
- ◆ Organizer of Seminar on Stacks and Groupoids, University of Western Ontario, 2009
- ◆ Maintain "Theoretical Atlas" mathematics research blog
- ◆ Mentor to new Graduate Teaching Assistants in UC Riverside Math Department, 2004 - 2007.

Conferences Attended

- ◆ Higher Structures in Mathematics and physics, Universitiät Göttingen, Nov 2011,
- ◆ Workshop on Representation Theoretical and Categorical Structures in Quantum Geometry and Conformal Field Theory, Universität Erlangen-Nürnberg, Oct 2011
- ◆ Higher Structures in Topology and Geometry V, Universität Hamburg, May 2011
- ◆ Workshop on Higher Gauge Theory, TQFT and Categorification, Cardiff University, May 2011
- ◆ Higher Gauge Theory, TQFT, and Quantum Gravity, IST, Lisbon, Feb 2011
- ◆ Philosophy of Science Association biannual Meeting, Nov 2010
- ◆ Oporto Meeting on Geometry, Topology and Physics, Faro, Portugal, July 2010
- ◆ Categories, Quanta, Concepts, Perimeter Institute, June 2009
- ◆ Quantum Gravity and Quantum Geometry 2008, University of Nottingham, July 2008
- ◆ Ottawa Mathematics Conference, University of Ottawa, 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, Nova Scotia, Canada, June 2006
- ◆ Barrett Lectures, University of Tennessee, Knoxville, May 2006
- ◆ Union College Mathematics Conference, Schenectady, NY, December 2005
- ◆ LOOPS '05, Max Planck Institute, Potsdam, Germany, October 2005
- ◆ CBMS Conference on the Geometrical Study of Differential Equations, Howard University, Washington DC, June 2000

References

(Available upon request)