

Education

Ph.D. Mathematics, 2010, M. Sci. Mathematics, 2007, University of California, Riverside, GPA 3.93.

Dissertation: higher category theory and relations to quantum algebras appearing in mathematical physics and computing.

- Dissertation Year Fellowship, 2009.
- Graduate Dean's Dissertation Research Grant, 2009.
- FQXi Foundational Questions Institute Grant, Categorifying Fundamental Physics, w. J. Baez (P.I.), 2009.
- National Science Foundation Grant, Quantum Computation, w. J. Baez (P.I.), 2007.
- Chancellor's Fellowship, 2005.

B. Sci. in Computer Science, Mathematics, 2005, City University of New York, Brooklyn College, GPA 3.95.

Programming Experience

Web Development: Designed Bootstrap website for local law firm, 2015. *remfamilylaw.com*

Apprentice, Independent Softwares A100 Program:

Built full-stack JavaScript application in Meteor: *babymeteor.meteor.com*.

Served as team member on 4-person developer team for local startup venture, HomeNucleus.

Trained in Agile process, programming, UI/UX, technical communication, and DevOps. Fall 2015 Cohort.

Game Development: Designing iOS puzzle game prototype in Swift with SpriteKit including all graphics in Adobe Photoshop and Illustrator, 2015. *Swift puzzle game on Github*

Software Development: Freelance maintenance of teacher evaluation application including development of front and back ends in PHP, JavaScript, MySQL, and HTML/CSS, 2015.

Artificial Intelligence: Designed prototype in C++ with language processing in Lex and Yacc and knowledge base queries in Prolog to benchmark relevance-sensitive belief revision processes, 2005.

Research & Teaching Experience

Visiting Assistant Professor, 2012 – 2014, Temple University, Philadelphia, PA US.

- Designed and taught Ph.D. level course in category theory.

Guest Researcher, 2011, Max-Planck-Institut für Mathematik, Bonn, DE.

Centre de Recherche en Mathématiques Postdoctoral Fellow, 2010 – 2012, University of Ottawa, Ottawa, CA.

- Taught courses in Euclidean and spherical geometry and discrete math in computer science.

Publications

What do homotopy algebras form? *Advances in Mathematics*, 2015. [arXiv.org:1406.1751](https://arxiv.org/abs/1406.1751).

Spans in 2-Categories: A Monoidal Tricategory. *Theory and Applications of Categories*, (to appear). [arXiv.org:1112.0560](https://arxiv.org/abs/1112.0560).

Formal Hecke algebras and algebraic oriented cohomology theories. *Selecta Mathematica*, 2013. [arXiv.org:1208.4114](https://arxiv.org/abs/1208.4114).

The Hecke Bicategory. *Axioms*, 2012. [arXiv.org:1007.1931](https://arxiv.org/abs/1007.1931).

Convenient Categories of Smooth Spaces. *Transactions of the American Mathematical Society*, 2011. [arXiv.org:0807.1704](https://arxiv.org/abs/0807.1704).

Nilpotency in type A cyclotomic quotients. *Journal of Algebraic Combinatorics*, 2010. [arXiv.org:0903.2992](https://arxiv.org/abs/0903.2992).

Higher Dimensional Algebra 7. *Theory and Applications of Categories*, 2010. [arXiv.org:0812.4864](https://arxiv.org/abs/0812.4864).

Categorified Symplectic Geometry & the Classical String. *Comm. Math. Physics*, 2010. [arXiv.org:0808.0246](https://arxiv.org/abs/0808.0246).

Meetings Organized

Young Researchers Workshop on Higher Algebraic and Geometric Structures. The Fields Institute, Toronto, CA. 2012.

Workshop on Category Theoretic Methods in Representation Theory. The Fields Institute, Ottawa, CA. 2011.

Categorification and Topological Invariants. Centre International des Rencontres Mathématiques, Luminy, FR. 2009.

Select Invited Lectures

University of Southern California. *Algebra Seminar*. “Formal Hecke Algebras & Oriented Cohomology Theories”, 2013.

University of Pennsylvania. *Deformations Seminar*. “Formal Hecke Algebras & Oriented Cohomology Theories”, 2012.

Jilin University, *Higher Structures in China III*. “Formal Hecke Algebras & Oriented Cohomology Theories”, 2012.

Courant Research Centre on Higher Order Structures, Göttingen, DE. “Categorifications of Hecke Algebras”, 2011.

University of the Algarve, Faro, PT. *XIX OMGTP*. “Antigravity for Cyclotomic Quotients of KLR-Algebras”, 2010.

U.C. Berkeley, *Topology Seminar*. “The Hecke Bicategory & the Zamolodchikov Tetrahedron Equation”, 2010.

CUNY Graduate Center. *NYC Category Theory Seminar*. “The Hecke Bicategory & the Tetrahedron Equation”, 2009.

American Mathematical Society. *Categorification and Link Homology*. “A Categorification of Hecke Algebras”, 2009.